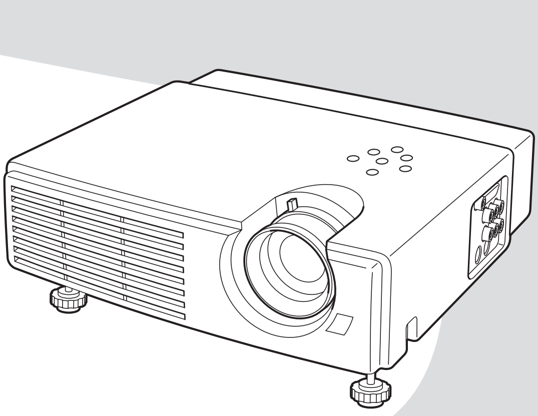
TOSHIBA

FILE NO. 330-200309

SERVICE MANUAL

DLP DATA PROJECTOR

TDP-MT500



TDP-MT500

DOCUMENT CREATED IN JAPAN, Nov., 2003

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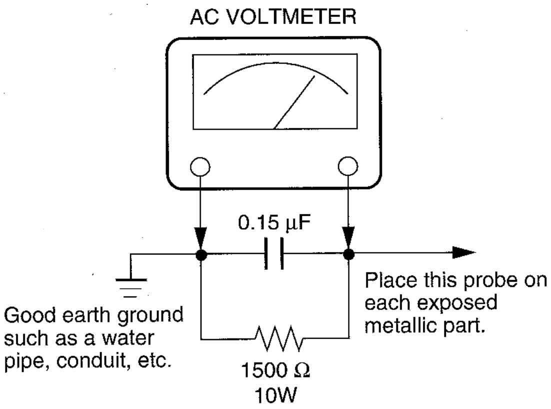
SAFETY PRECAUTION

WARNING: Service should not be attempted by anyone unfamiliar with the necessary precautions on this projector. The following are the necessary precautions to be observed before servicing this chassis.

1 . An isolation Transformer should be connected in the power line between the projector and the AC line before any service is performed on the projector.
2. When replacing a chassis in the cabinet, always be certain that all the protective devices are put back in place, such as; non-metallic control knobs, insulating covers, shields, isolation resistor-capacitor network etc.
3. Before returning the set to the customer, always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as terminals, screwheads, metal overlays, control shafts etc. to be sure the set is safe to operate without danger of electrical shock. Plug the AC line cord directly into a AC outlet (do not use a line isolation transformer during this check). Use an AC voltmeter having 5000ohm per volt or more sensitivity in the following manner: Connect a1500ohm 10W resistor, paralleled by a 0.15 μF, AC type capacitor, between a known good earth ground (water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500ohm resistor and 0.15 μF capacitor. Reverse the AC plug at the AC outlet and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 5.25V(rms). This corresponds to 3.5 mA(AC). Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.


AC VOLTMETER
0.15 μF
Good earth ground such as a water pipe, conduit, etc.
Place this probe on each exposed metallic part.
1500 Ω
10W

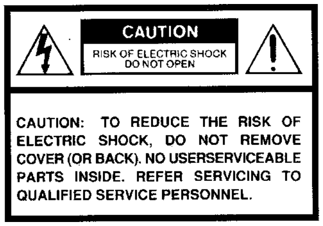
PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by the international hazard symbols on the schematic diagram and the parts list.
Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire or other hazards.

ULTRAVIOLET DANGER IN SERVICE MODE

Eye damage may result from directly viewing the light produced by the lamp used in this product. Always turn off lamp before opening this cover. Ultraviolet radiation eye protection required during servicing.

SAFETY PRECAUTIONS



CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USERSERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

⚡ The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

⚠ The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: **TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE. DANGEROUS HIGH VOLTAGES ARE PRESENT INSIDETHE ENCLOSURE. DO NOT OPEN THE CABINET. REFER SERVICING TO QUALIRED PERSONNEL ONLY.**

CAUTION: Laser beam is emitted when the laser button of the remote control is pressed. Do not look from the front of the remote control. Do not face toward a person or to a mirror.

FCC Radio Frequency Interference Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiates radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING: Changes or modifications made to this equipment, not expressly approved by Toshiba, or parties authorized by Toshiba, could void the user's authority to operate the equipment.

Notice: This Class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

IMPORTANT PRECAUTIONS

Save Original Packing Materials

The original shipping carton and packing materials will come in handy if you ever have to ship your projector. For maximum protection, repack the set as it was originally packed at the factory.

Avoid Volatile Liquid

Do not use volatile liquids, such as an insect spray, near the unit. Do not leave rubber or plastic products touching the unit for a long time. They will mar the finish.

Moisture Condensation

Never operate this unit immediately after moving it from a cold location to a warm location. When the unit is exposed to such a change in temperature, moisture may condense on the crucial internal parts. To prevent the unit from possible damage, do not use the unit for at least 2 hours when there is an extreme or sudden change in temperature.

In the spaces provided below, record the Model and Serial No. located at the rear of your projector.

Mode No.____________________ Serial No. ____________________

Retain this information for future reference.

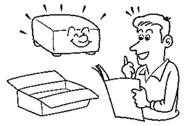
IMPORTANT SAFETY INSTRUCTIONS

CAUTION: PLEASE READ AND OBSERVE ALLWARNINGS AND INSTRUCTIONS GIVEN IN THIS OWNER'S MANUAL AND THOSE MARKED ON THE UNIT. RETAIN THIS BOOKLET FOR FUTURE REFERENCE.

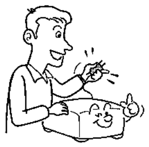
This set has been designed and manufactured to assure personal safety. Improper use can result in electric shock or fire hazard. The safeguards incorporated in this unit will protect you if you observe the following procedures for installation, use and servicing. This unit is fully transistorized and does not contain any parts that can be repaired by the user.

DO NOT REMOVE THE CABINET COVER, OR YOU MAY BE EXPOSED TO DANGEROUS VOLTAGE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL ONLY.

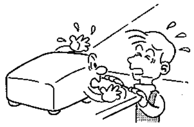
1. **Read Owner's Manual**
   After unpacking this product, read the owner's manual carefully, and follow all the operating and other instructions.



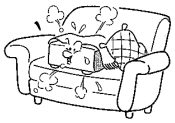
2. **Power Sources**
   This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company.
   For products intended to operate from battery power, or other sources, refer to the operating instructions.



3. **Source of Light**
   Do not look into the lens while the lamp is on. The strong light from the lamp may cause damage to your eyes or sight.

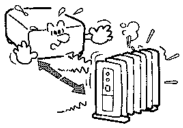


4. **Ventilation**
   Openings in the cabinet are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating, and these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug or other similar surface. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

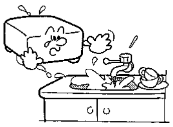


IMPORTANT SAFETY INSTRUCTIONS

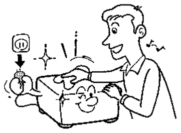
5. **Heat**
   The product should be situated away from heat sources such as radiators heat registers, stoves, or other products (including amplifiers) that produce heat.



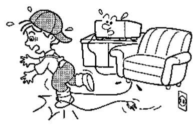
6. **Water and Moisture**
   Do not use this product near water - for example, near a bath tub, wash bowl, kitchen sink, or laundry tub; in a wet basement; or near a swimming pool and the like .



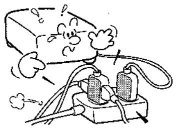
7. **Cleaning**
   Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.



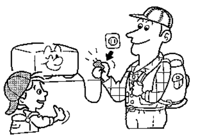
8. **Power-Cord Protection**
   Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.



9. **Overloading**
   Do not overload wall outlets; extension cords, or integral convenience receptacles as this can result in a risk of fire or electric shock.



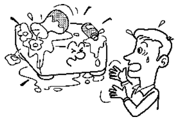
10. **Lightning**
    For added protection for this product during storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet.
    This will prevent damage to the product due to lightning and power-line surges.



IMPORTANT SAFETY INSTRUCTIONS

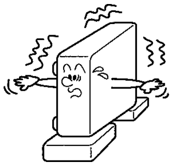
11. Object and Liquid Entry

Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.



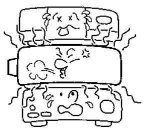
12. Do not place the product vertically

Do not use the product in the upright position to project the pictures at the ceiling, or any other vertical positions. It may fall down and dangerous.



13. Stack Inhibited

Do not stack other equipment on this product or do not place this product on the other equipment.
Top and bottom plates of this product develops heat and may give some undesirable damage to other unit.

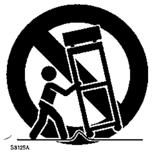


14. Attachments

Do not use attachments not recommended by the product manufacturer as they may cause hazards.

15. Accessories

Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the product. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturer's instructions and should use a mounting accessory recommended by the manufacturer.
A product and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.



IMPORTANT SAFETY INSTRUCTIONS

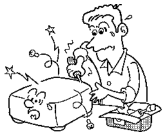
16. Damage Requiring Service

Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

a) When the power-supply cord or plug is damaged.
b) If liquid has been spilled, or objects have fallen into the product.
c) If the product has been exposed to rain or water.
d) If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
e) If the product has been dropped or damaged in any way.
f) When the product exhibits a distinct change in performance - this indicates a need for service.

17. Servicing

Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

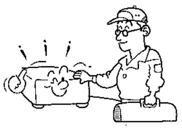


18. Replacement Parts

When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards. (Replacement of the lamp only should be made by users.)

19. Safety Check

Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.



1. Safety Precautions

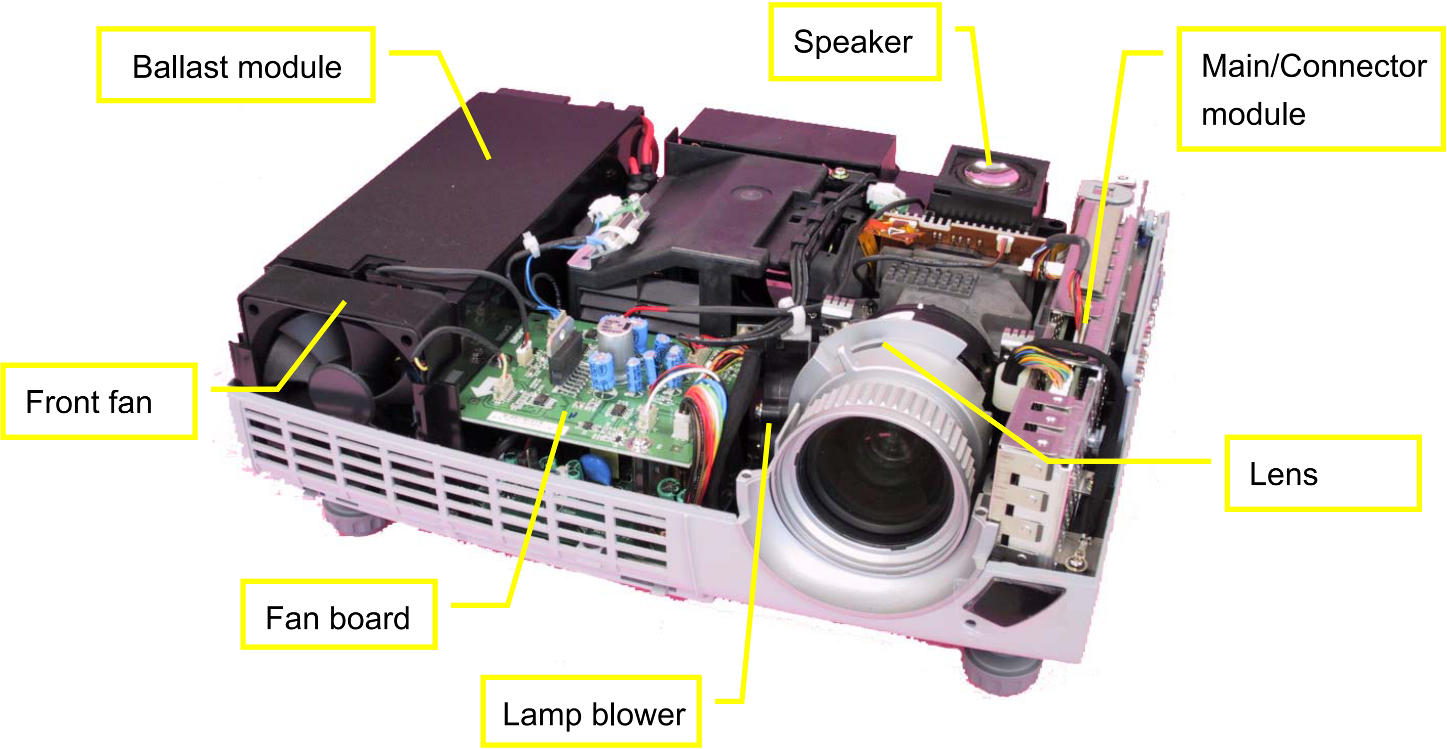
1. Be sure to read this manual before servicing and save it for future reference.
2. The lamp becomes extremely hot during operation. Allow the projector to cool for approximately 45 minutes prior to removing the lamp assembly for replacement. Do not operate lamps beyond the rated lamp life. Excessive operation of lamps beyond the rated life could cause them to explode on rare occasions.
3. Never replace the lamp assembly or any electronic components unless the projector is unplugged.
4. To reduce the risk of electric shock, do not disassemble this appliance. Take it to a qualified technician when service or repair is required. Incorrect re-assembly can cause electric shock when the appliance is subsequently used.
5. Do not place this product on an unstable cart, stand, or table. The product may fail, sustaining serious damage.

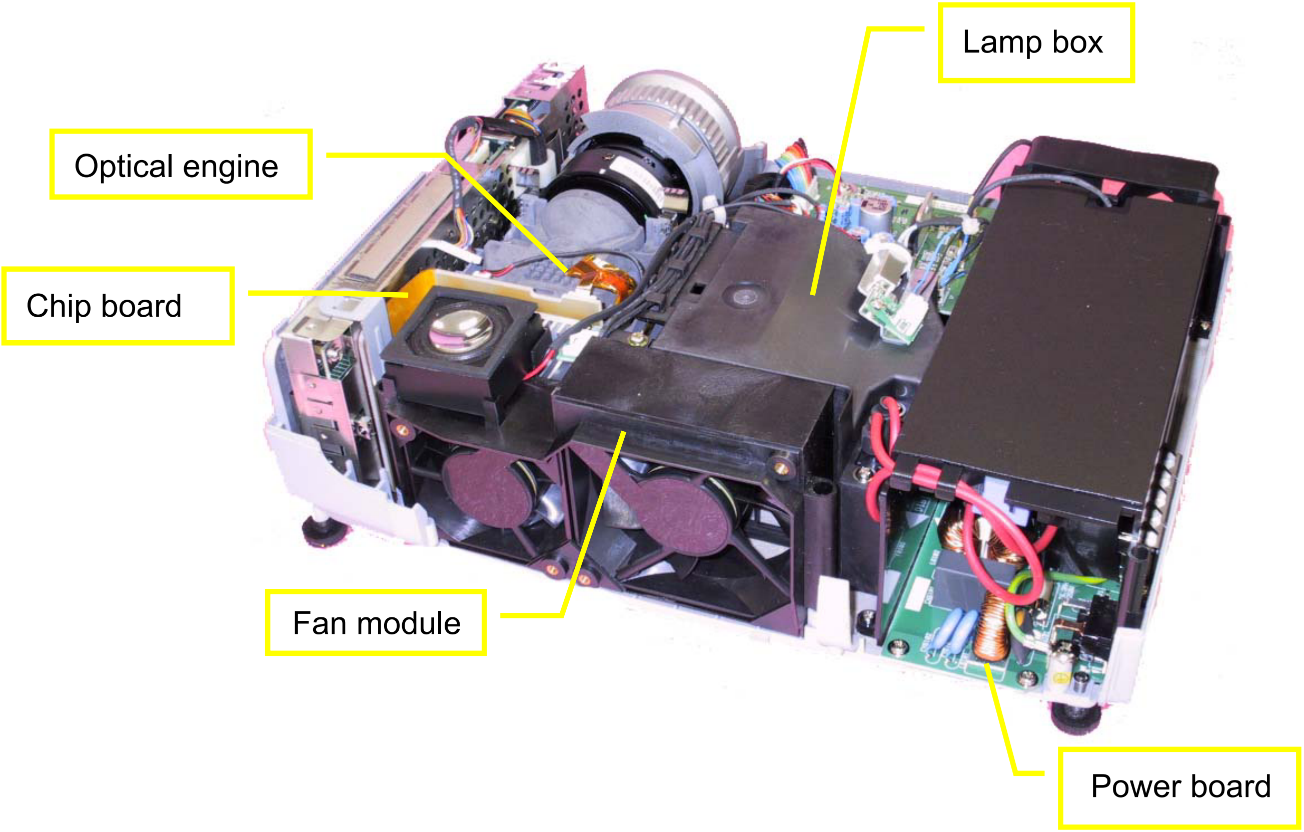
2. Servicing Precautions

1. When replace the lamp, be sure to avoid burns your fingers because the lamp becomes too hot.
2. Never touch the lamp bulb with a finger or anything else. Never drop it or give it a shock. They may cause bursting of the bulb.
3. This projector is provided with a high voltage circuit for the lamp. Do not touch the electric parts of power unit when turn on the projector.
4. Do not touch the exhaust fan during operation.

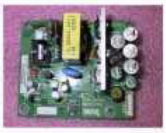
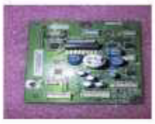
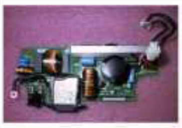
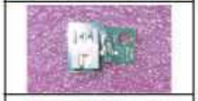
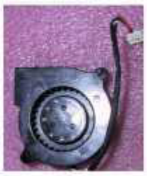
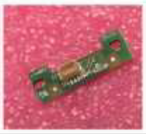
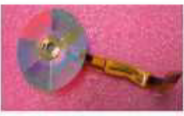
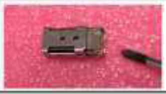
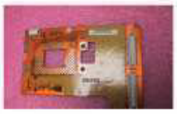
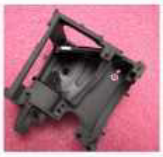
3. Exploded View

The top illustration shows the parts from the front of the projector.The illustration on the next page shows the parts visible from the rear of the projector.To see exploded views of the case parts, major components and optical engine.

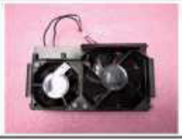

Ballast module
Speaker
Main/Connector module
Front fan
Lens
Fan board
Lamp blower

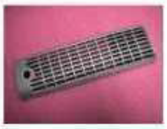
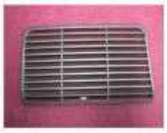

Lamp box
Optical engine
Chip board
Fan module
Power board

4. Spare Parts

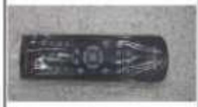
No.	S/N	Description	Picture
1	55.J6005.001	PCBA DC-DC/BD	
2	55.J6013.021	PCBA FAN/BD	
3	60.J6007.001	ASSY PFC MODULE	
4	55.J3419.001	PCBA THERMAL/B	
5	23.10085.001	BLOWER 12V*51*51*15 NMB BM5115	
6	35.80J13.081	UVAR QUARTZ PROT 1.1MM MARS	
7	55.J1313.001	PCB 1L SENSOR-B BD SL700 X MI	
8	65.J6001.001	CW DIA 50 6 SEGS	
9	35.71J60.001	LIGHT PIPE 6.3*2.9*20	
10	55.J6023.001	PCBA CHIP/BD	
11	60.J1326.061	ASSY HSG DMD 16:9	

12	65.J1309.042	ASSY ZOOM LENS PROT BOXLIGHT	
13	71.07XGA.B00	IC DMD 0.7XGA DDR 12	
14	55.J6001.011	PCBA MAIN BD	
15	55.J6002.011	PCBA DMD/BD	
16	60.J6013.011	ASSY LAMP DOOR Y8053C	
17	23.10084.001	FAN 12V70*70*20 SUNON GM1207P	
18	55.J2003 .001	PCBA IR/BD	
19	60.J3409.001	ASSY CAP LENS TRANS.	
20	65.J3403.001	ASSY BALLAST210W/USHIO	
21	60.J6082 .001	ASSY LOWER CASE	
22	65.J3406.001	ADJUST FOOT FRONT MARS	
23	60.J6084 .001	ASSY UPPER CASE	
24	55.J6012.021	PCBA KEYPAD/BD	

25	60.J6008.001	ASSY REAR FAN HLD MODULE	

28	60.J6020 .001	ASSY REAR VENT	
29	60.J6018.001	ASSY FRONT LOUVER	
30	44.J3401.081	CTN AB MT500/TOSHIBA	
31	47.J6014 .001	CSN LEFT	
32	47.J6015 .001	CUSHION RIGHT EPE	

34	49.J6001.011	MANUAL USER	
35-1 35-2	27.01818.121 27.02718.541	CORD SVT#18 10A 125V US W0/S CORD H05VVF 3G 10A 3M EUR	
36	50.J5801.501	CABLE RGA / DVI-A LINK 1800M	
37	50.J6008.501	CABLE RS232(F)+C/MD8P(M)1800	

38	98.J6003 .001	REMOTE CONTROL	

5. Block Diagram

1. System Block Diagram

The projector uses XGA (1024x768) DMD to display image. Normally, the 16x9 image is displayed on 1024 x 576 area. In the vertical direction, the image always is displayed on the central area, the top and bottom area is always black.

This video projector can accept the following six kinds of input sources:

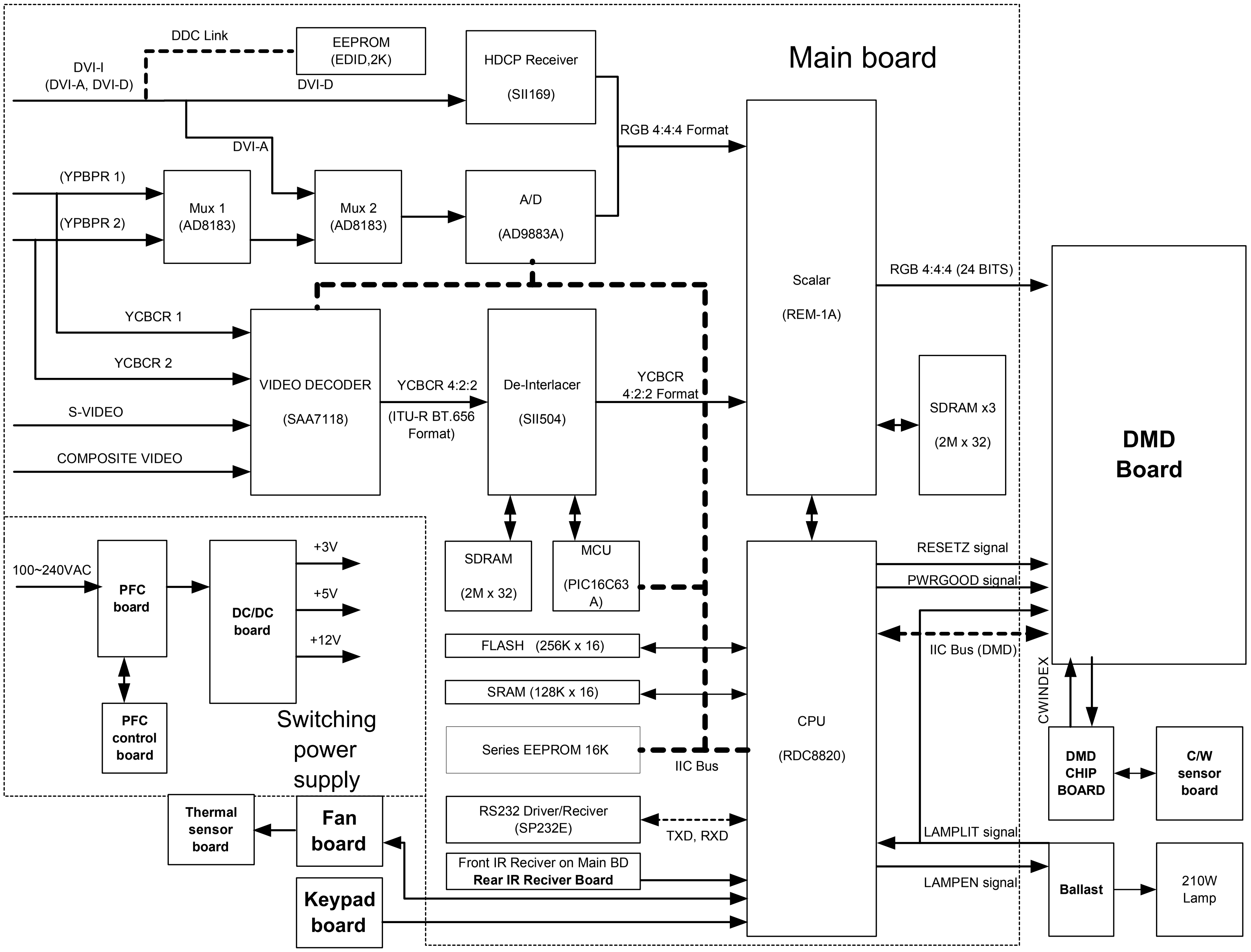
(1) DVI-Analog (DVI-I connector)
(2) DVI-Digital (DVI-I connector)
(3) Component 1
(4) Component 2
(5) S-Video
(6) Composite

As shown in the system block diagram, there are eleven boards in the system. They are:

(1) Main Board
(2) DMD Board
(3) DMD Chip Board
(4) Fan Board
(5) Thermal Sensor Board
(6) Color Wheel Sensor Board
(7) Keypad Board
(8) Ballast
(9) PFC board
(10) PFC control board
(11) DC/DC board

In the main board circuits, it contains AD converter (AD9883), HDCP receiver (SII169), Video decoder (SAA7118), de-interlace processor (Sii504), Scalar (OPLUS RAM-1A) and CPU (RDC8820).

The DMD board formats RGB 4:4:4 signals into the signal format that DMD chip can accept.


Main board
DDC Link
EEPROM (EDID,2K)
DVI-I (DVI-A, DVI-D)
DVI-D
HDCP Receiver (SII169)
DVI-A
(YPBPR 1)
(YPBPR 2)
Mux 1 (AD8183)
Mux 2 (AD8183)
A/D (AD9883A)
RGB 4:4:4 Format
Scalar (REM-1A)
RGB 4:4:4 (24 BITS)
YCBCR 1
YCBCR 2
S-VIDEO
COMPOSITE VIDEO
VIDEO DECODER (SAA7118)
YCBCR 4:2:2 (ITU-R BT.656 Format)
De-Interlacer (SII504)
YCBCR 4:2:2 Format
SDRAM x3 (2M x 32)
DMD Board
SDRAM (2M x 32)
MCU (PIC16C63 A)
FLASH (256K x 16)
SRAM (128K x 16)
Series EEPROM 16K
IIC Bus
RS232 Driver/Reciver (SP232E)
TXD, RXD
Front IR Reciver on Main BD
Rear IR Reciver Board
CPU (RDC8820)
RESETZ signal
PWRGOOD signal
IIC Bus (DMD)
CWINDEX
LAMPLIT signal
LAMPEN signal
DMD CHIP BOARD
C/W sensor board
Ballast
210W Lamp
100~240VAC
PFC board
PFC control board
DC/DC board
+3V
+5V
+12V
Switching power supply
Thermal sensor board
Fan board
Keypad board

6. Alignment Procedure

1. Replacement of the DMD chip (DMD Bias Voltage Alignment)

Equipment:

- None

Procedure:

Watch DMD chip Label (This adjustment may affect the DMD lift time. Please adjust it correctly.)

Switch the DIP switch on DMD board according to the character on the DMD chip:

	B	C	D	E
1 of SW H1	1	1	0	0
2 of SW H2	1	0	1	0

1 (On): Left; 0 (Off):Right

2. Replacement of the color wheel (Color wheel delay adjustment)

Equipment and test signal:

- Personal computer (PC) that can output the XGA signal
- XGA signal (Red-scale pattern for adjustment)

Preparation:

- Replace the color wheel with a new one.
- Connect the DVI-A terminal of the product with the output terminal of the PC, and output the XGA signal from the PC.
- Turn on the power of the product and display the XGA signal supplied to the DVI-A terminal.
- Select OPTION in the menu and execute SETTING CLEAR.

<How to enter the factory adjustment mode>

- Select OPTION in the menu and then select LAMP OPERATION TIME.
- Press the cursor buttons on the control panel or the remote control in the order of Right, Left, Right, and Left, and then press the ENTER button.
- Press the MENU button, and a red character will appear in the lower right corner of the screen, which indicates that the factory adjustment mode has been activated.
- Press the MENU button again, and FACTORY OSD will appear.
- Every time you press the MENU button when FACTORY OSD is on the screen, FACTORY OSD will disappear and appear alternately. (Even when FACTORY OSD disappears, the factory adjustment mode remains activated.)

<How to exit the factory adjustment mode>

- When FACTORY OSD is on the screen, select FACTORY and press the ENTER button.
- Select RETURN USER OSD and press the ENTER button.
- Alternatively, you can exit the factory adjustment mode by turning off the power.

Procedure:

1. Enter the factory adjustment mode. Select DLP of FACTORY OSD and press the ENTER button.
2. Adjust the value of CW DELAY to adjust the color of red optimally.
   - Adjustment range: -64 to +64
   - The color changes to pink as the value is decreased, and it changes to orange as the value is increased.
3. Make sure that all the levels of the red-scale pattern for adjustment are displayed in correct colors.
4. The new setting value is automatically saved. After finishing the adjustment, exit the factory adjustment mode.

3. Replacement of the PCB-MAIN (Relocation of the memory IC)

Equipment:

- None

Procedure:

1. Remove the following ICs from the broken PCB-MAIN, and replace the same ICs on a new PCB-MAIN with these ICs.
   - U10: For storage of the adjustment data
   - U37: For storage of the DDC data
2. Install the new PCB-MAIN and assemble the product. Check the product's operation.

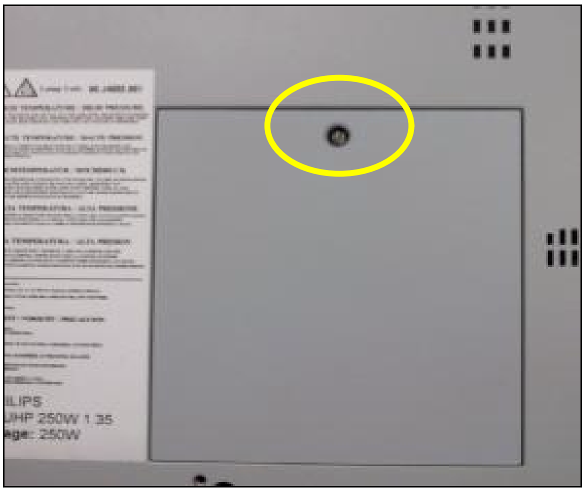
7. Disassenbly

7.1 Lamp module

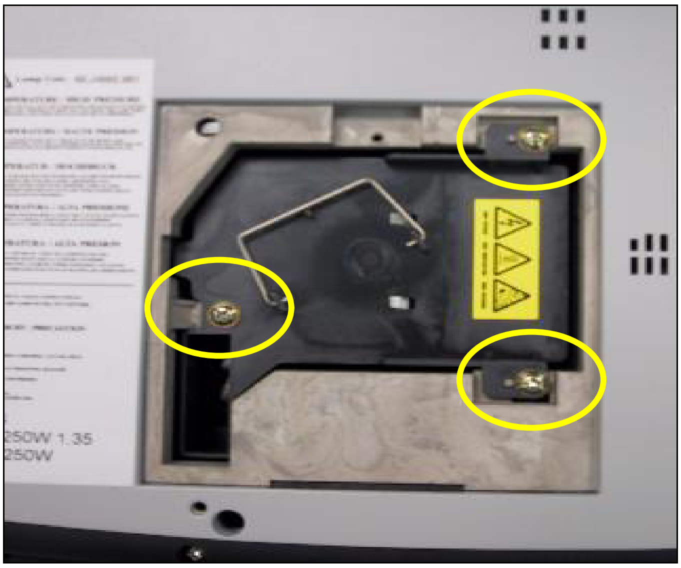
The lamp module is located at bottom of the projector. The lamp module behinds the lamp cover with 3 captive screws. After you replace the lamp module, you should reset the lamp hour counter. The switch interrupts power supply output to the projector if you remove the lamp cover.

WARNING Allow the projector to cool before removing the lamp module. The lamp module becomes very hot when the projector is in use. DO NOT touch any part of the lamp module that is located in the lamp box. Oils from your fingers will cause smudges and uneven heating of lamp surfaces, resulting in decreased image quality and premature lamp failure. If the lamp is ruptured or the lamp module is cracked or damaged, be careful of quartz or glass fragments that could cause personal injury.

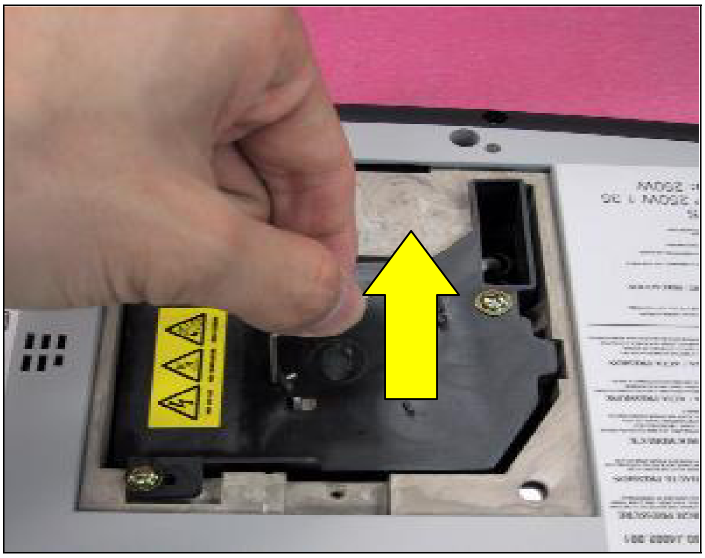
1.Remove one screw of lamp cover which is a spring door.



2. Remove the 3 screws from the lamp module.



3. Grasp the handle on the lamp module and pull the module out of the lamp box.

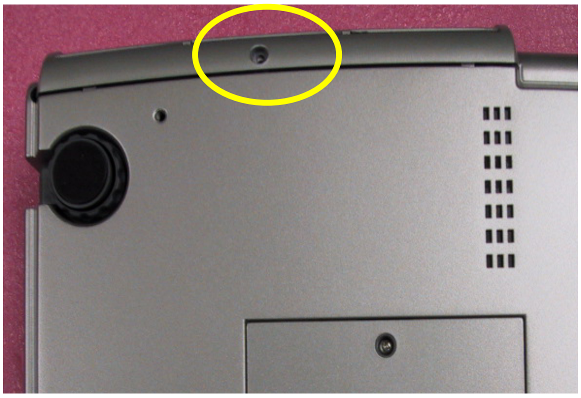


7.2 Covers

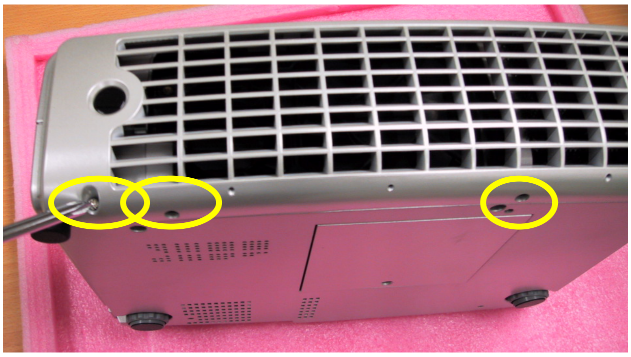
7.2.1 Front & Rear bezel

The front bezel covers the front of the projector and helps secure the top case to the bottom case.

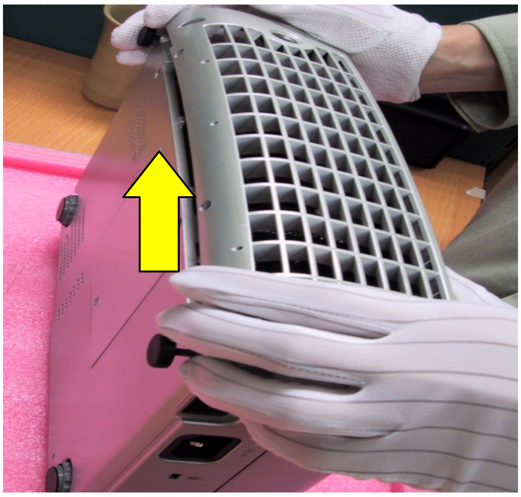
1. Remove the 1 screw under the projector of front bezel, and remove front bezel out of projector.



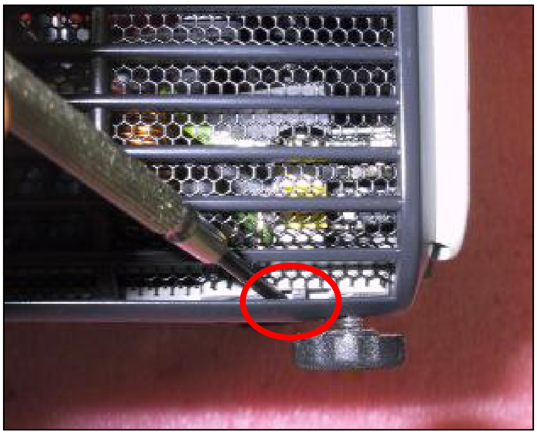
2. Remove the right and left screw of the rear bezel.



3.Push bottom case near the rear bezel and lift rear bezel.



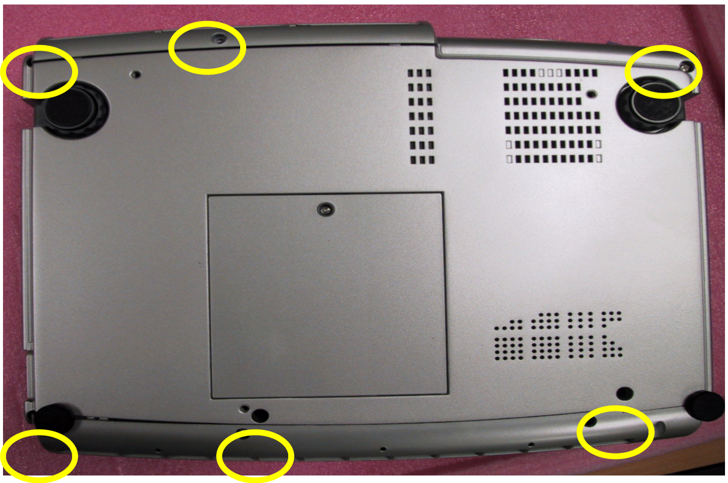
4.There is a plastic fasten to bottom right case.



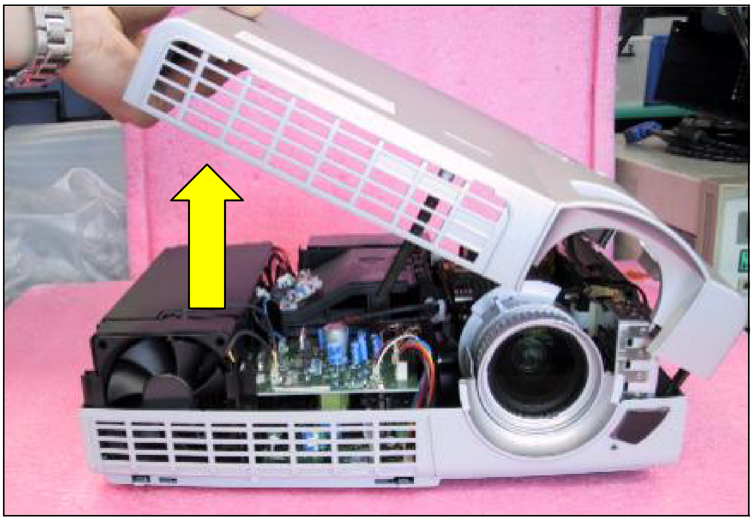
7.2.2 Top case

The top case encloses the top half of the projector. It includes the keypad and speaker. When you just replace the top case only, you don't remove the lamp module.

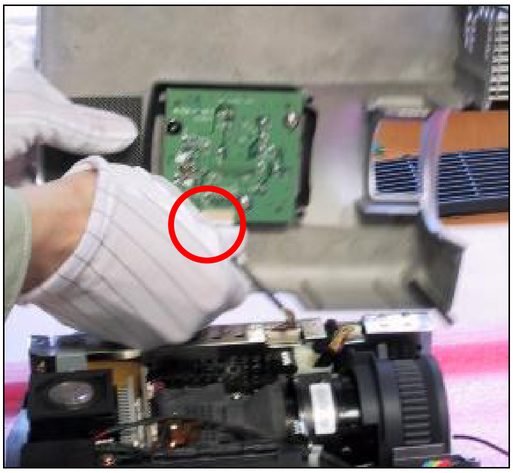
1. Remove the 4 long screws (black) and 2 short screws (white).



2. Carefully turn the unit over and lift the top case from the projector.



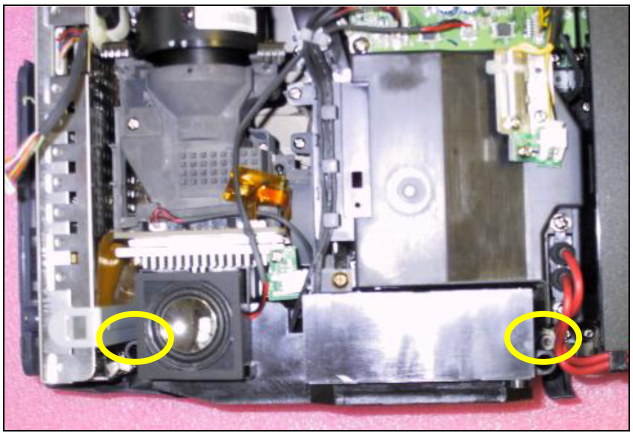
3. Place the unit upside-down and detach the keypad cable from theirs connector on the PC board interface.



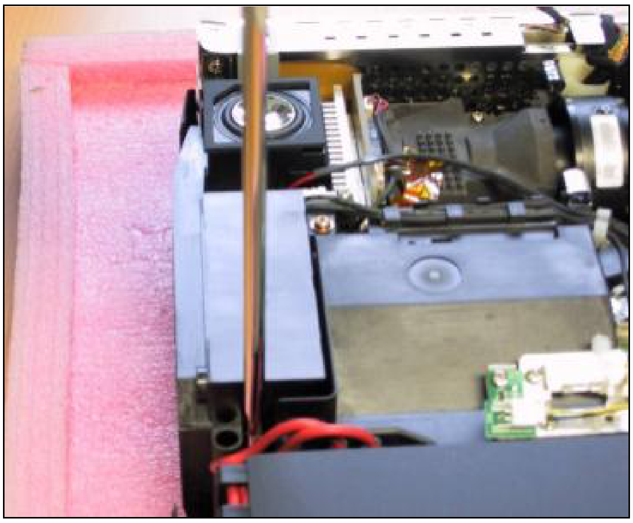
7.3 Back fan and Speaker

The back fan of the projector and fits between the top case and the bottom case. It fastens to the 2 fans and 1 speaker with 2 screws. You should remove 2 screws and 3 cables.

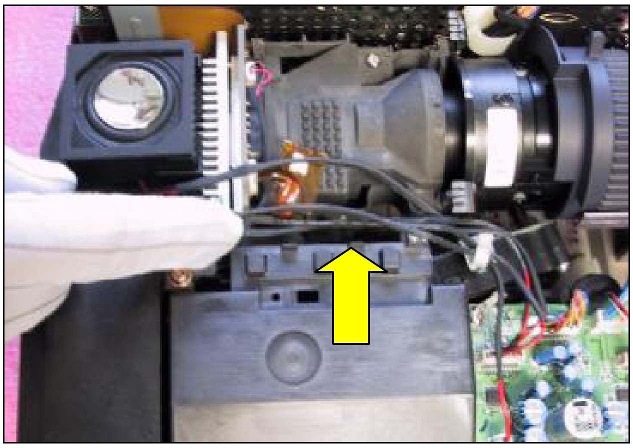
WARNING Rear bezel provides the thermal solution with 2 fans. Dust within fans will reduce the effect on heating solution.



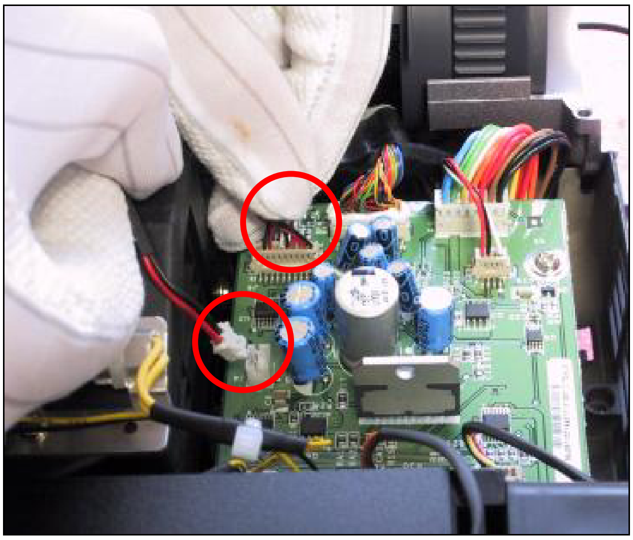
1. Remove the 2 screws.



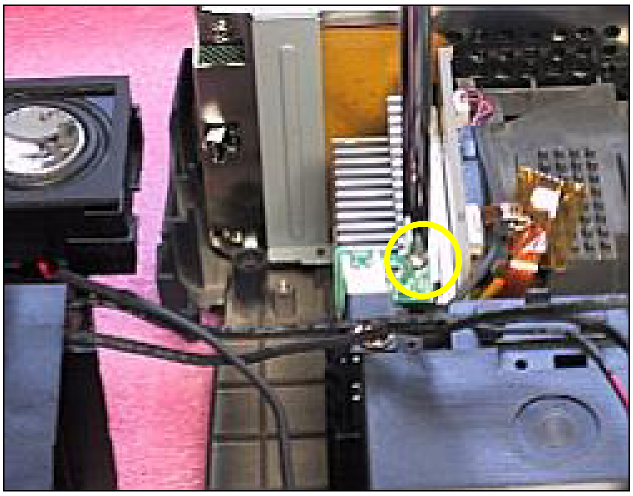
2. Place the cables out of the hooks



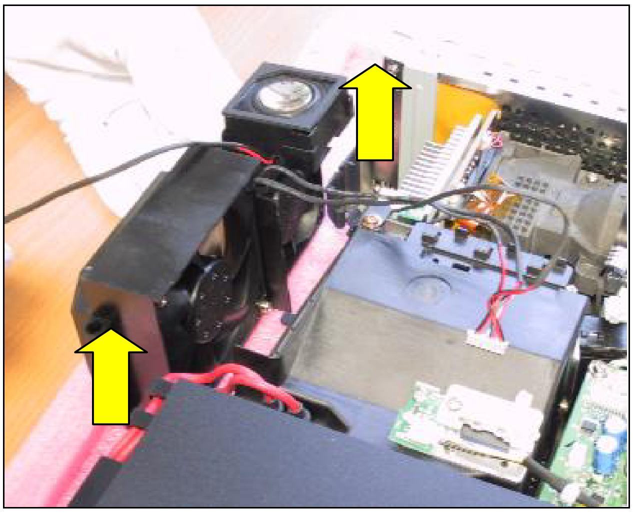
3.Remove 2 cables.



4.Remove 1 screw on thermal board.

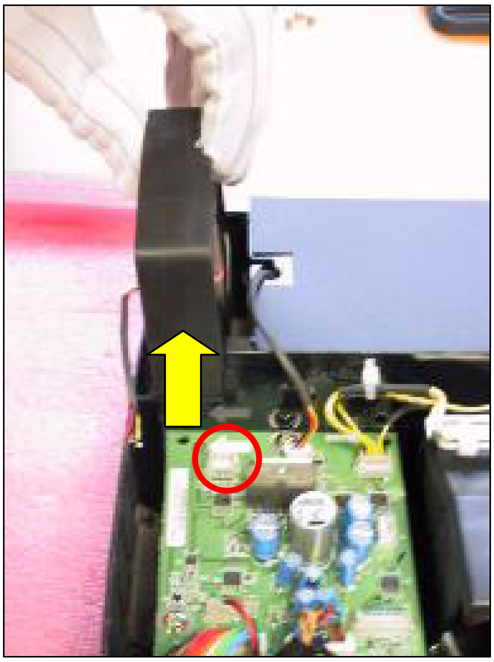


5.Lift the back fans up.



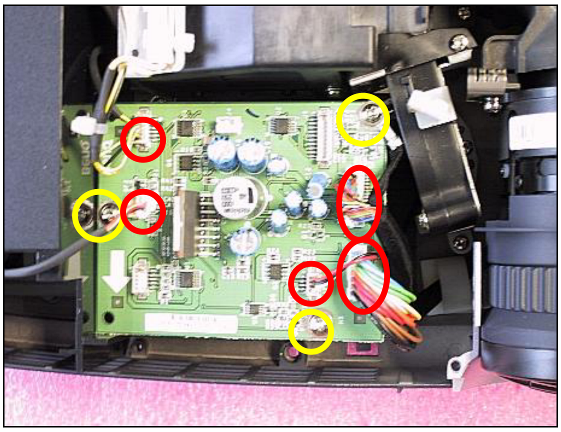
7.3.1 Front Fan

1.Remove 1 cable and lift front fan out.

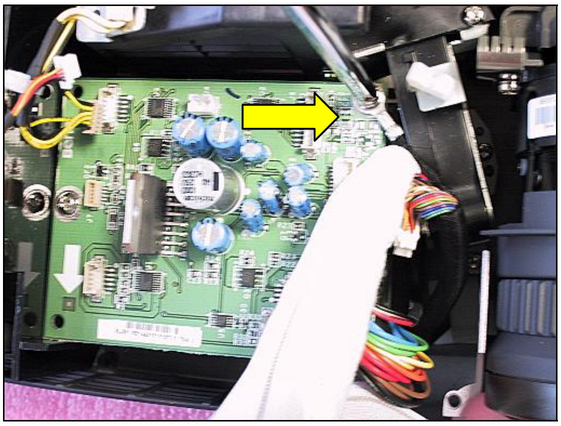


7.3.2 Fan board

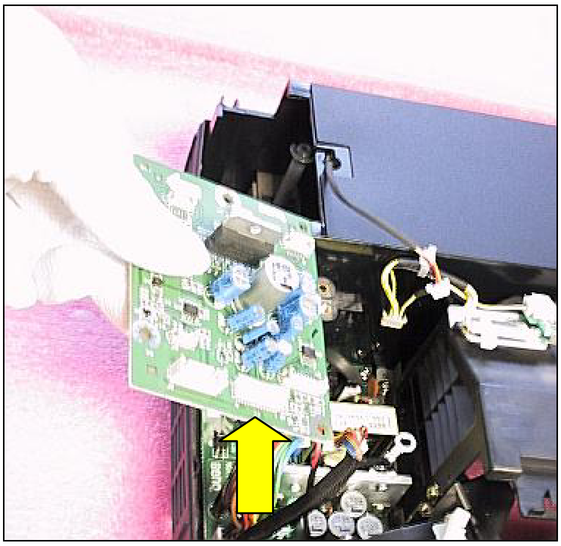
1.Remove 3 screws and 5 cables



2.Note: When you replace this screw and ground cable. Please keep it to end of right.



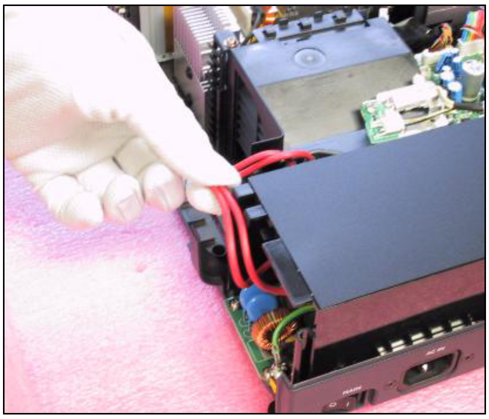
3.Lift fan board out of DC-DC board.



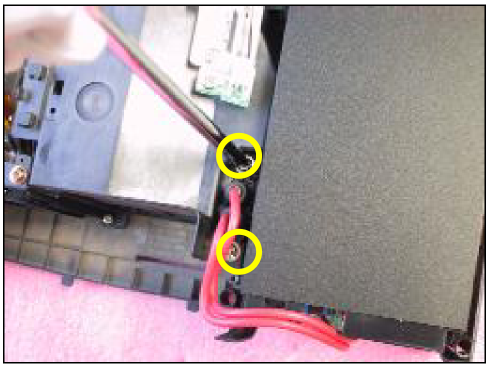
7.4 Ballast and Power Supply

The ballast is located on the side of the projector opposite the lens. The ballast receives power from the power supply, stepping it up to ignite the lamp module.

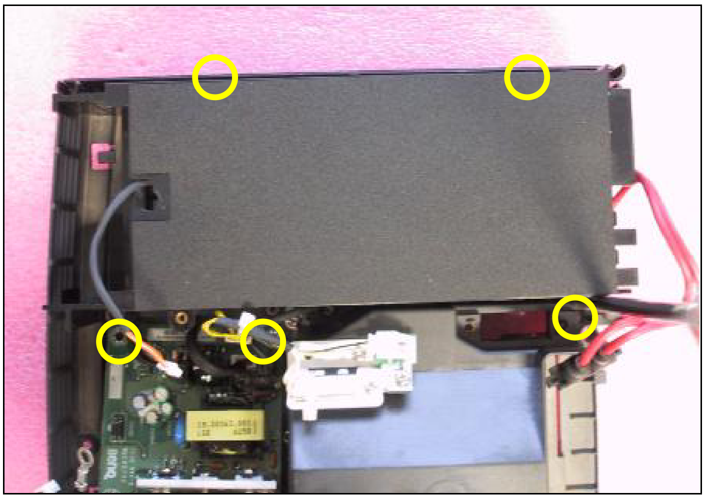
1.Remove red cable out of hooks.



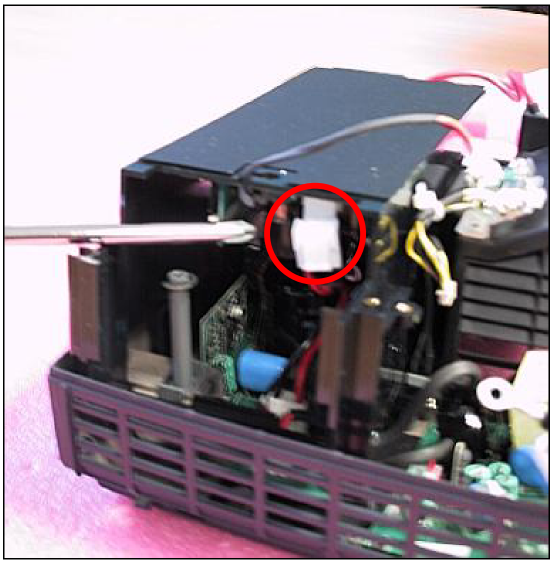
2.Remove 2 screws.



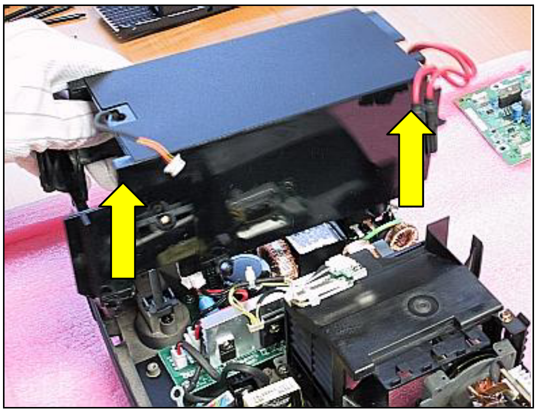
3.Rmove 5 screws. 2 is on EMI board, and 3 is on ballast box.



4.Rmove 1 cable fasten to ballast.



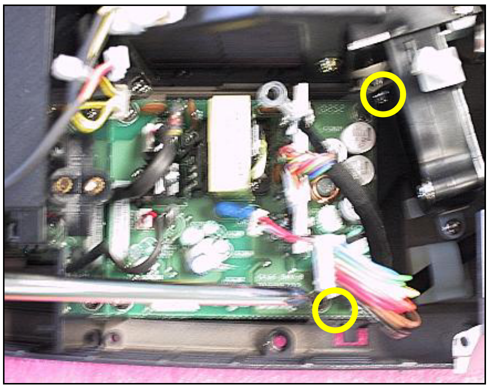
5.Lift ballast case with ballast.



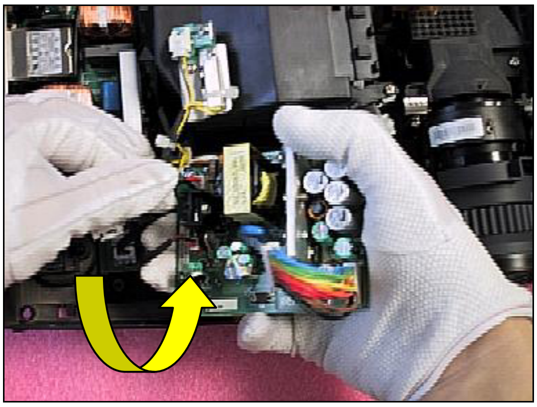
7.5 DC-DC board

The DC-DC board fastens to the power supply under the optical engine. It transfers DC to lower DC from power board.

1.Remove 2 jack screws on DC-DC board.



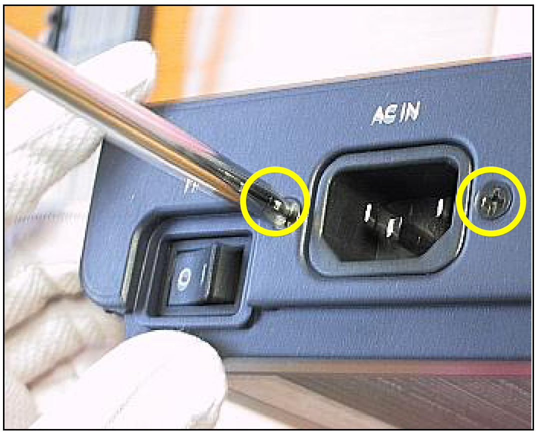
2.Lift the DC-DC board out of bottom case.



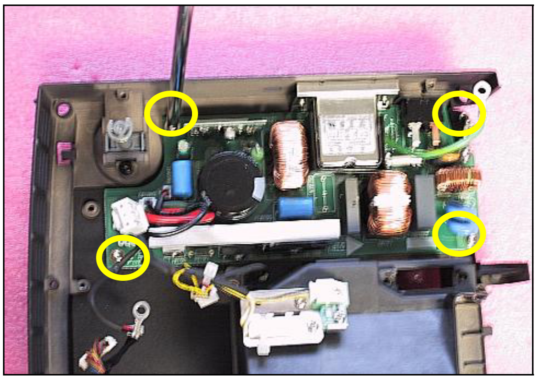
7.6 Power Supply

The power supply is located near the ballast at the front of the projector. It fastens to the bottom case and converts the 100 to 240 V AC supply voltage to various low voltage DC levels required internally by the projector. The power supply interfaces with the ballast to control lamp strike and operation and to detect the electrical condition of the safety interlock switch.

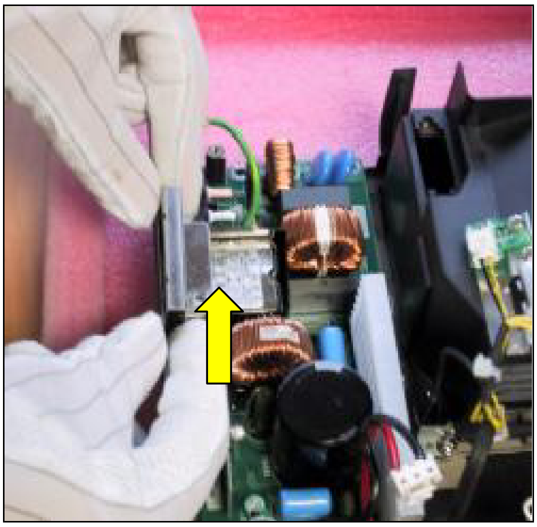
1.Remove 2 screws on lift case.



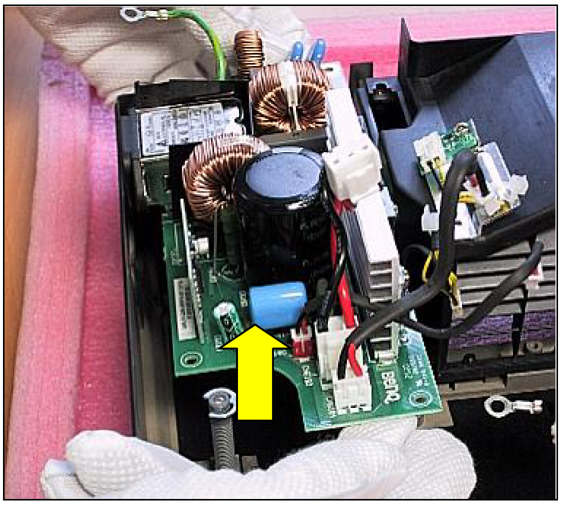
2.Remove 4 screws on bottom case.



3.Remove AC inlet metal.



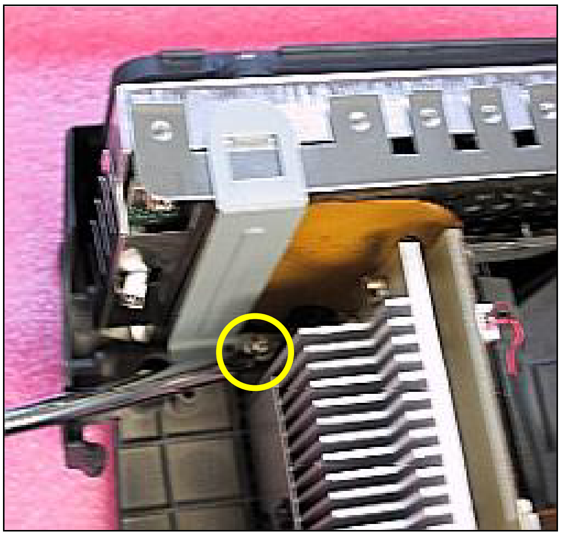
4.Lift Power board from bottom case.



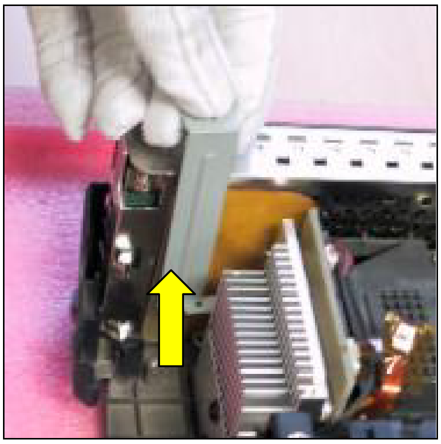
7.7 Main/Connector module

The main/connector module is located beneath the top cover at right of the optical engine. It includes a connector cover, input board and the PC board interface.

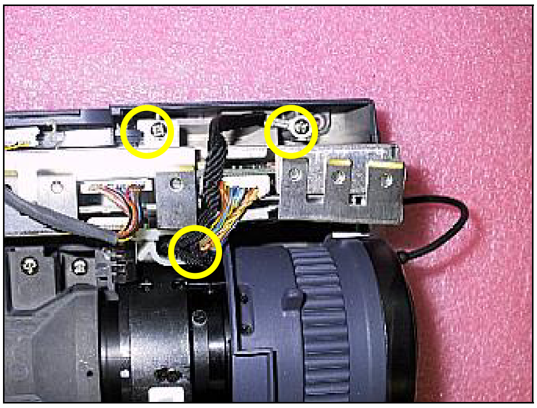
1.Remove 1 screw.



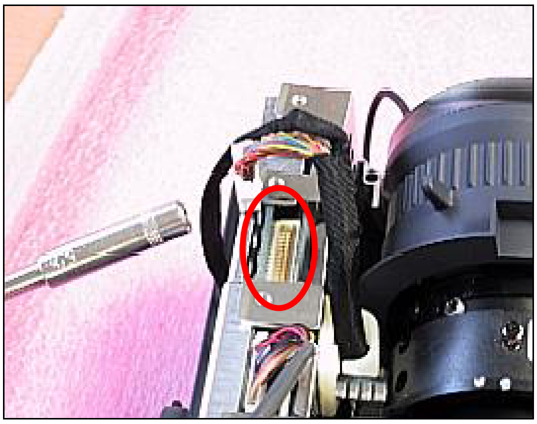
2. Lift the metal stick from the PC board interface.



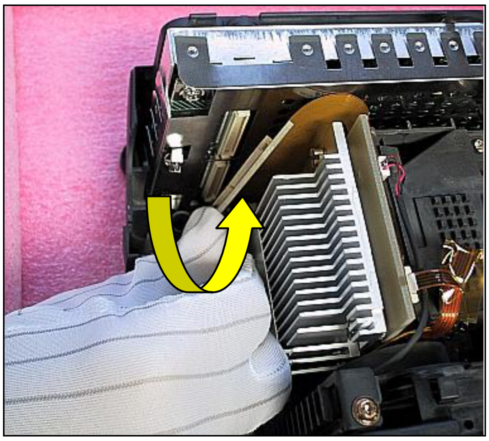
3.Remove 3 screws.



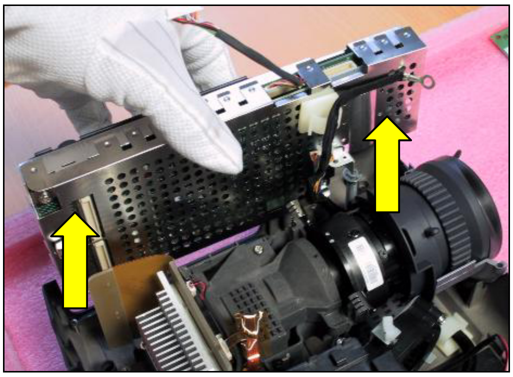
4.Remove 1 cable on main board.



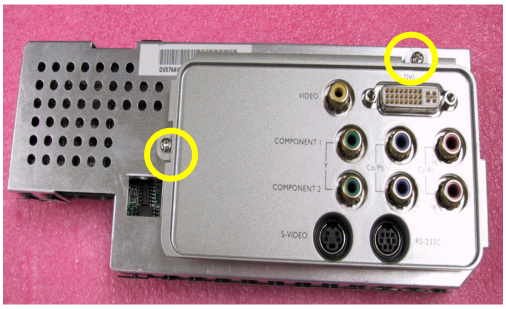
5.Lift the ZIP connector form PC board interface and DMD chip board.



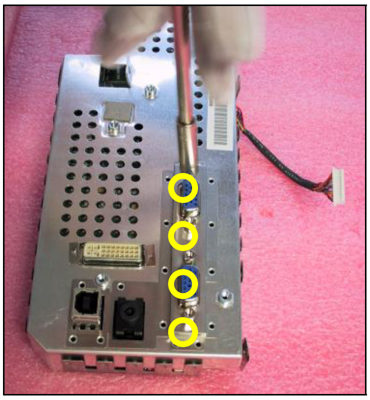
6.Main board module



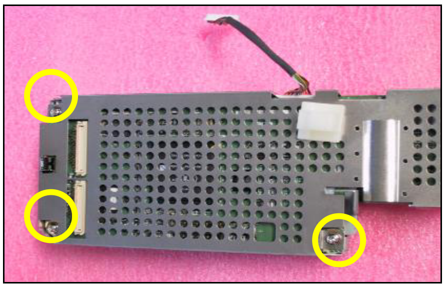
7.Remove 2 screws.


VIDEO
COMPONENT 1
COMPONENT 2
S-VIDEO
RS-232C

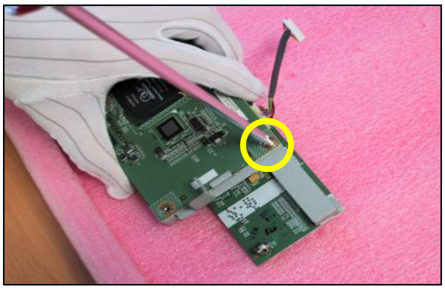
8.Remove 4 jack screws.



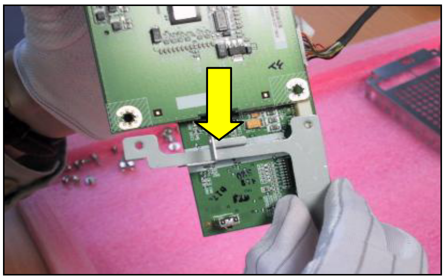
9.Remove 3 screws.



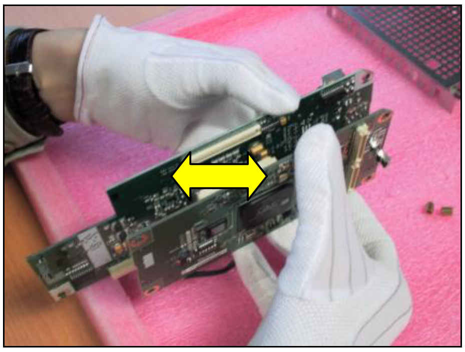
10.Remove 1screw.



11.Remove 1 metal from main board.



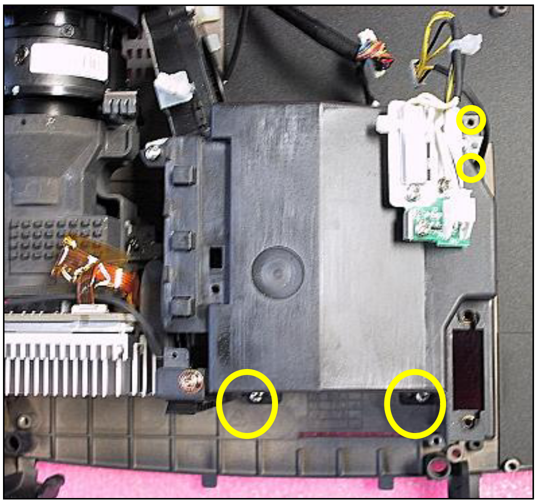
12.Divide two boards into each one.(One is DLP board, another is main board)



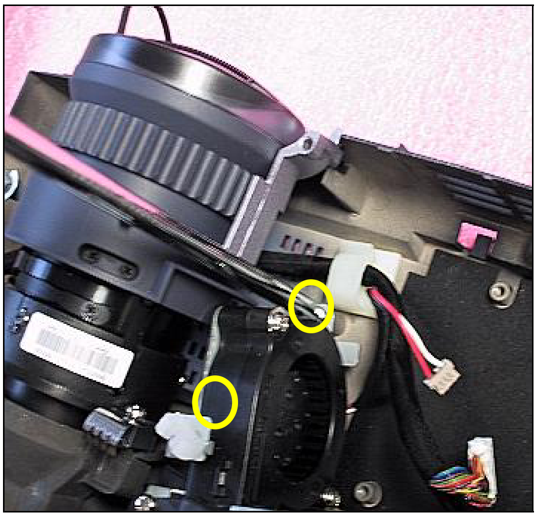
7.8 Lamp box with Blower

The lamp box is fastens to thermal switch/power switch. It helps secure the lamp module to the bottom case. The lamp blower is fastens to lamp box on the bottom case. The blower directs cool air around the lamp.

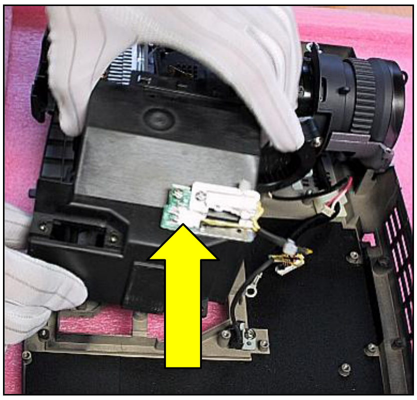
1.Remove 4 screws



2.Remove 2 screws of fan blower.



3.Lift lamp box and blower with thermal board.

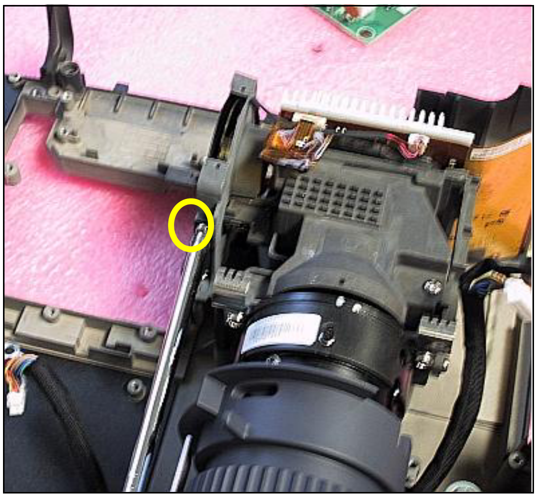


7.9 Color wheel module

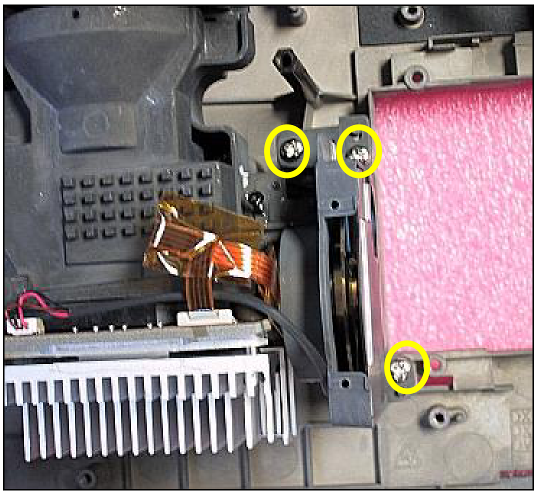
The color wheel module is located on bottom case between lamp box and optical engine.

CAUTION The color wheel is in the color wheel module. Take extreme care not to bump it with a tool or press against it because it is very delicate. Aviod any touching on color wheel and dust causes image quality decreasing. A broken color wheel requires engine replacement.

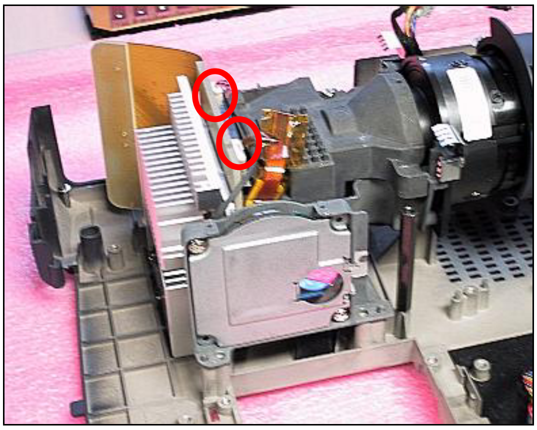
1. Remove 1 screw.



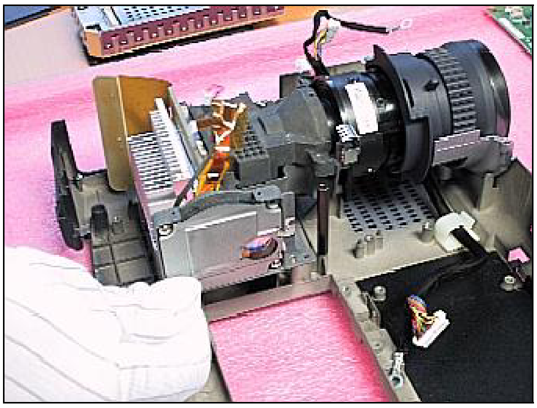
2. Remove 3 screws.



3. Remove 2 cables.



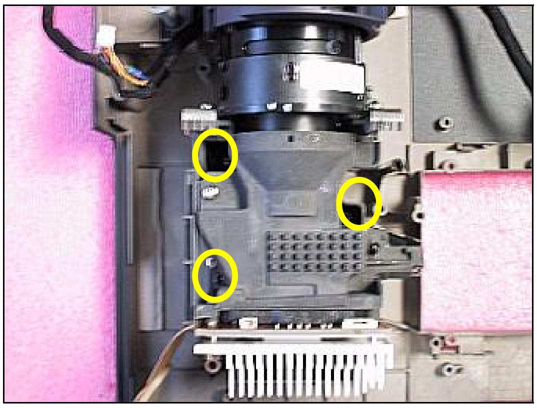
4. Lift Color wheel module.



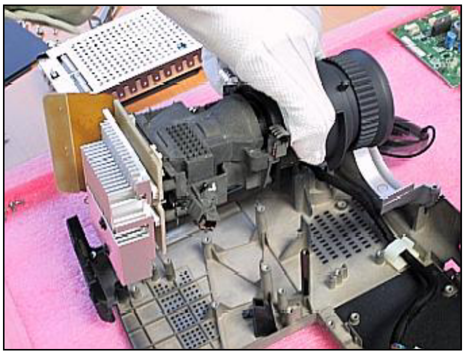
7.10 Optical engine

The optical engine is located beneath the main/connector board at the side of the projector opposite the ballast. It fastens to the bottom case and produces the projected image by directing focused light from the lamp module through the color wheel and onto the Digital Micromirror Device (DMD).

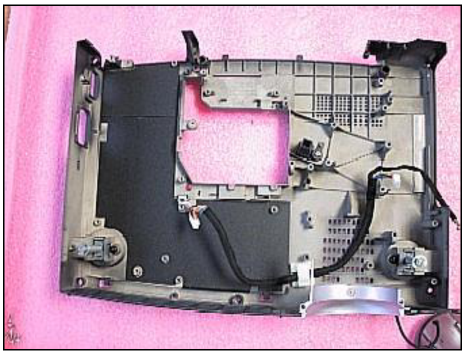
1.Remove 3 screws.



2.Lift optical engine.



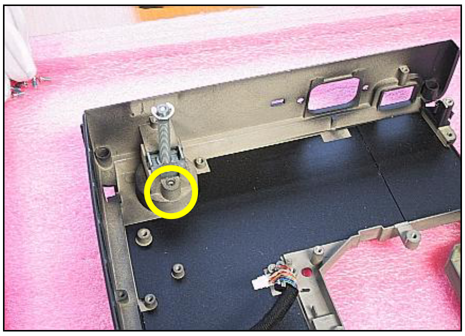
3.Remove 1 cable.



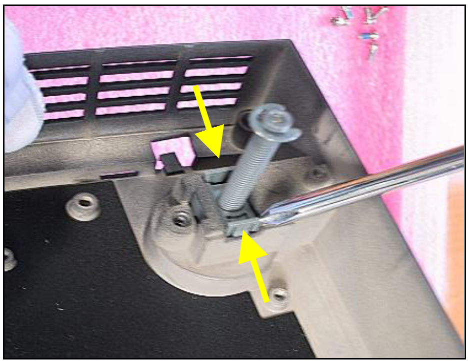
7.11 Foot adjust

The foot adjust is located in the bottom case. The foot adjust stick slides up or down through the bottom case to raise or lower the front of the projector when you press the actuator button on the side of the bottom case.

1.Remove 1 screw.



2. Pull the release latch of the foot adjust outward to disengage the connection between the foot adjust and the bottom case.



8. Frequently Asked Questions

1. Why this unit doesn't turn on?

1) There is no power from power cable.

Plug the power cord into the AC inlet on the side of this unit, and plug the power cord into the power inlet.

2) The power switch isn't turned on.

Turn on the power switch.

3) Users might turn on this unit again within the cooling down procedure.

Waiting this unit complete the cooling down procedure.

4) Front lamp cover isn't attached well.

Correctly attach the front lamp cover.

2. Why the unit has no picture?

1) The front lamp cover is not correctly attached

Correctly attach the front lamp cover.

2) This unit is not correctly connected to the input source device.

Check the connection.

3) The input signal has not been correctly selected.

Select the correct input signal with INPUT key on the remote control.

4) The input signal has not been correctly selected in " INPUT SOURCE " item in " DISPLAY Setting Page ".

Select the correct input signal.

3. Why the unit's image is unstable?

1) The connection cables are not connected to this unit.

Correctly connect the cables to the appropriate terminals.

4. Why the unit's picture is burred?

1) The projection lens is not correctly focused.

Adjust the focus of projection lens with the focus ring.

2) This unit and the screen are not placed squarely (90 degree).

Adjust the projection angle, direction and the height of this unit.

5. Why the units' remote control does not work correctly?

1) The batteries are exhausted.

Replace both batteries with new ones.

6. Why the "LAMP LED blink" is in red?

1) The front lamp cover is not correctly attached.

Correctly attach the front lamp cover.

2) The temperature inside this unit is extremely high.

Check that the ventilation holes are not blocked.

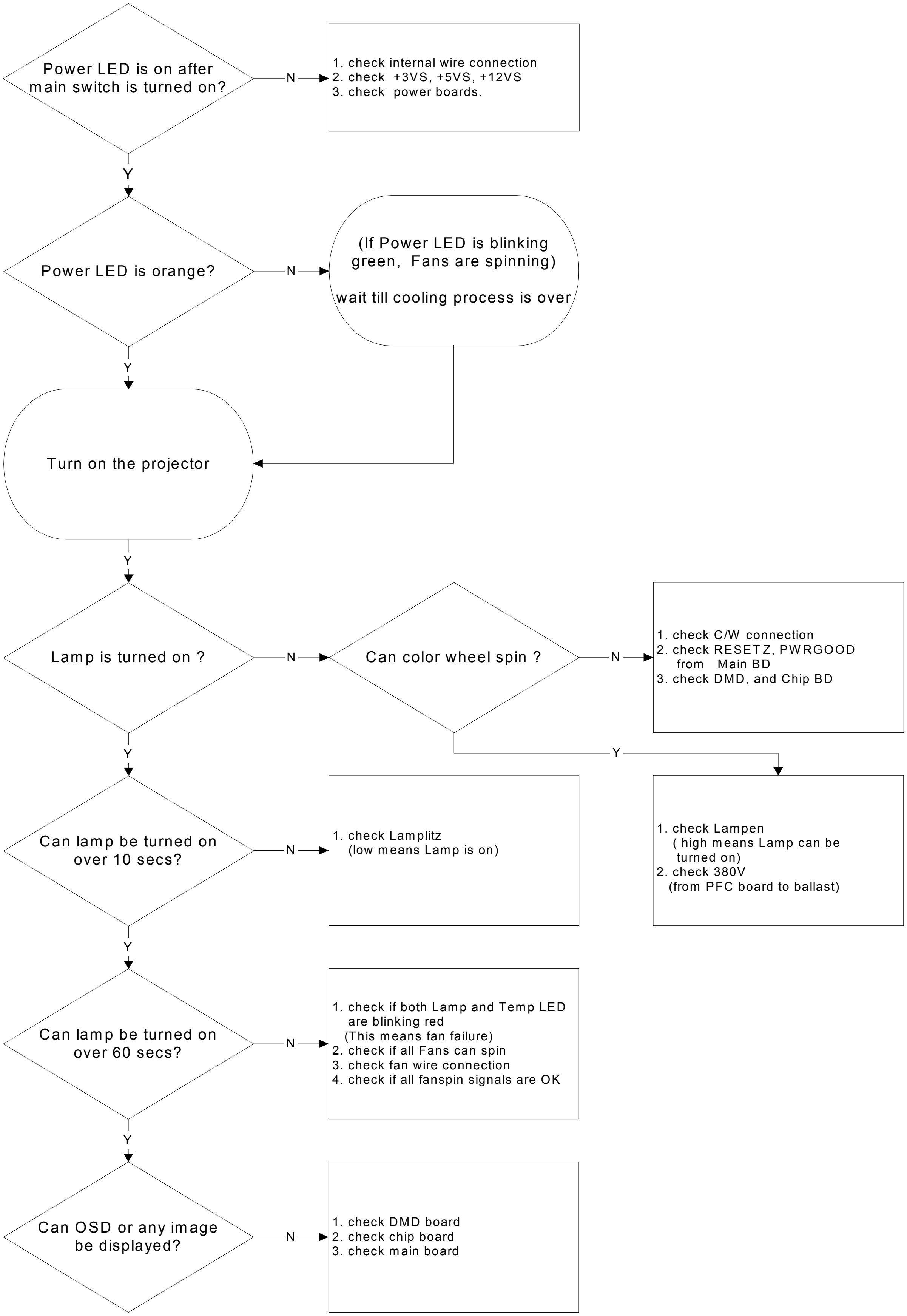
7. Why the "POWER LED blink" is in orange and green sequentially?

1) The lamp has exceeded its specified usage hours or the lamp has burned out.

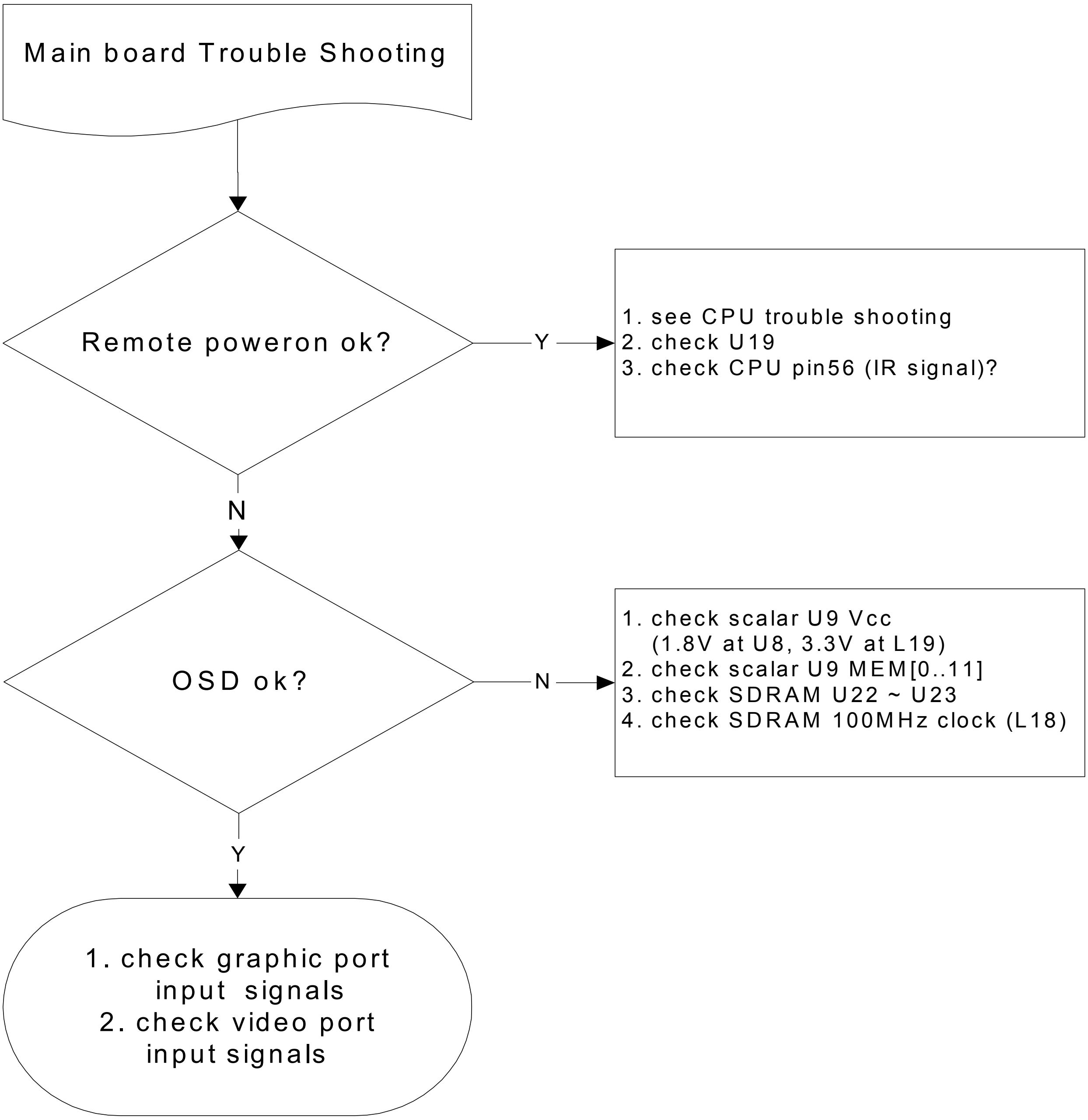
Replace the lamp with a new one.

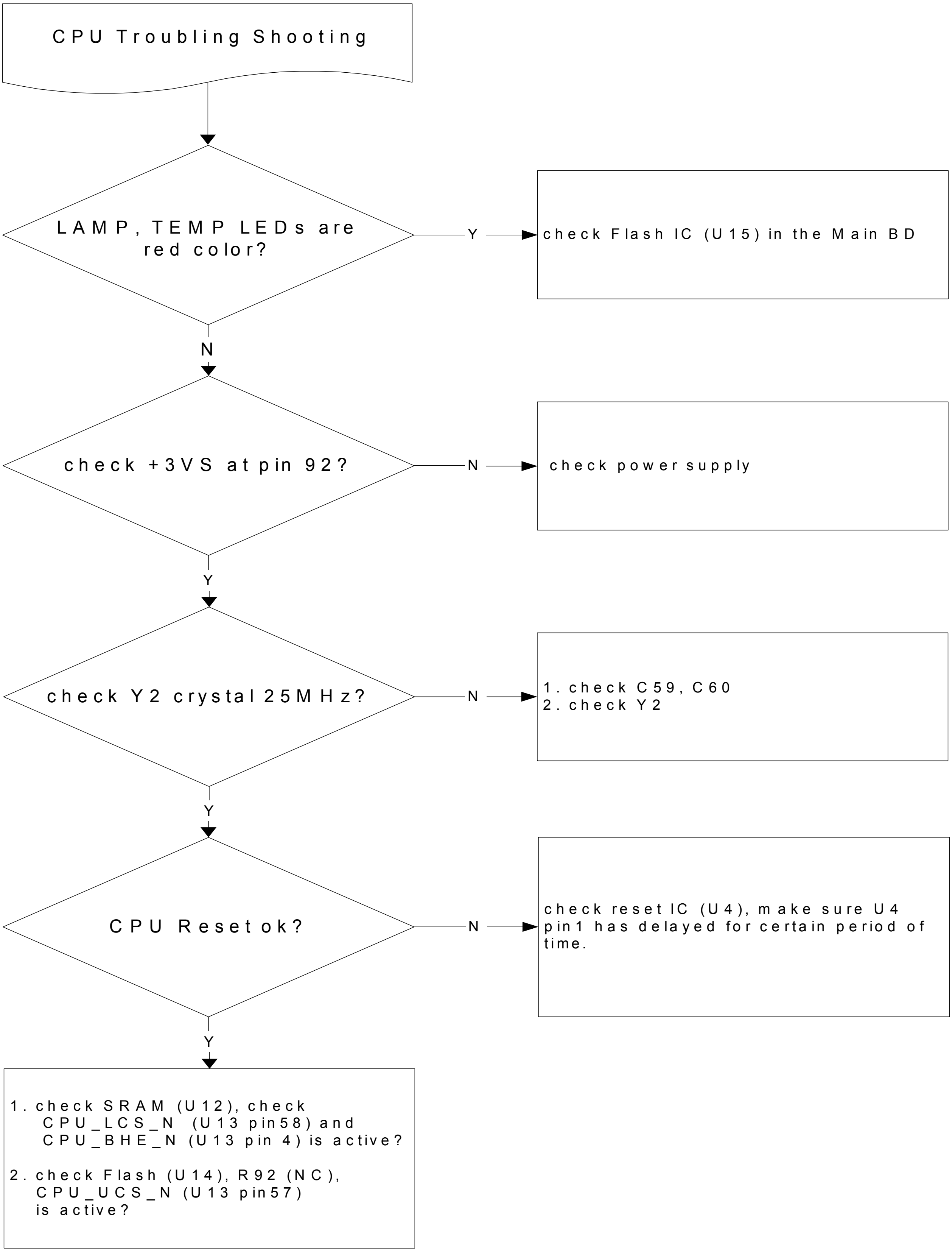
9. Trouble Shooting Guide

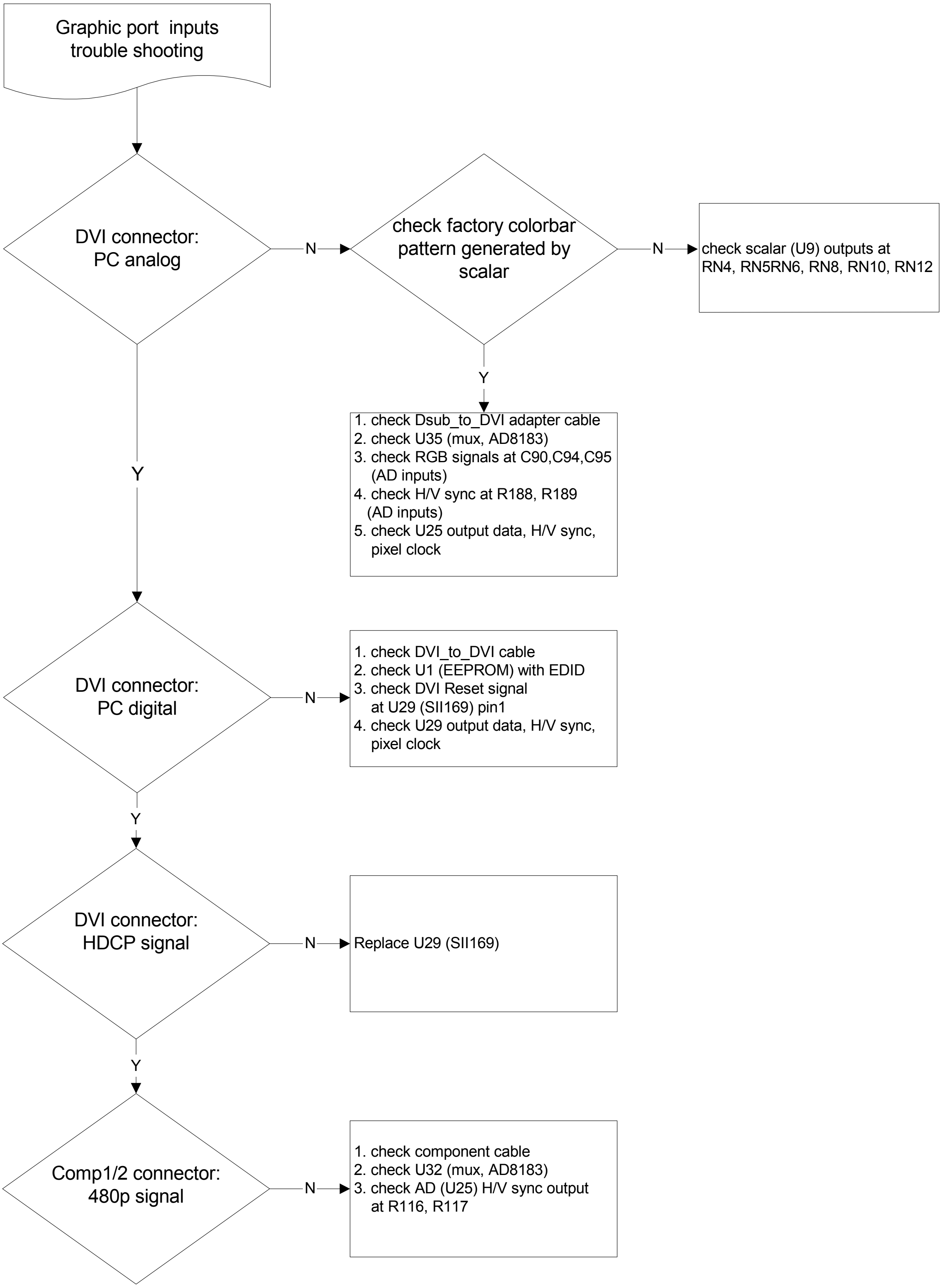
1) System Trouble Shooting:


Power LED is on after main switch is turned on?
N
1. check internal wire connection
2. check +3VS, +5VS, +12VS
3. check power boards.
Y
Power LED is orange?
N
(If Power LED is blinking green, Fans are spinning)
wait till cooling process is over
Y
Turn on the projector
Y
Lamp is turned on ?
N
Can color wheel spin ?
N
1. check C/W connection
2. check RESETZ, PWRGOOD from Main BD
3. check DMD, and Chip BD
Y
1. check Lampen (high means Lamp can be turned on)
2. check 380V (from PFC board to ballast)
Y
Can lamp be turned on over 10 secs?
N
1. check Lamplitz (low means Lamp is on)
Y
Can lamp be turned on over 60 secs?
N
1. check if both Lamp and Temp LED are blinking red (This means fan failure)
2. check if all Fans can spin
3. check fan wire connection
4. check if all fanspin signals are OK
Y
Can OSD or any image be displayed?
N
1. check DMD board
2. check chip board
3. check main board

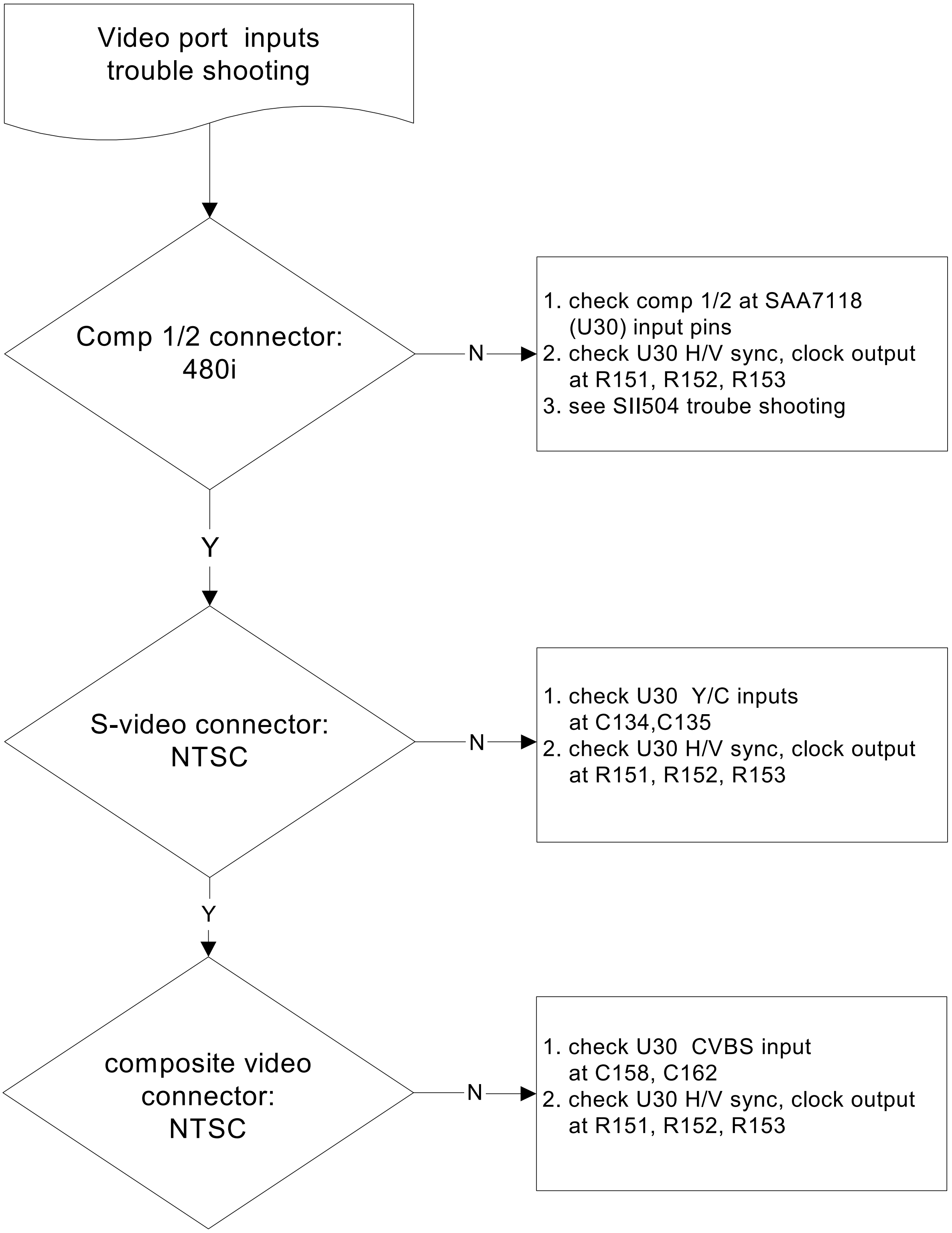
2) Main board:


Main board Trouble Shooting
Remote poweron ok?
Y
1. see CPU trouble shooting
2. check U19
3. check CPU pin56 (IR signal)?
N
OSD ok?
N
1. check scalar U9 Vcc
(1.8V at U8, 3.3V at L19)
2. check scalar U9 MEM[0..11]
3. check SDRAM U22 ~ U23
4. check SDRAM 100MHz clock (L18)
Y
1. check graphic port
input signals
2. check video port
input signals


CPU Troubling Shooting
LAMP, TEMP LEDs are red color?
Y
check Flash IC (U15) in the Main BD
N
check +3VS at pin 92?
N
check power supply
Y
check Y2 crystal 25MHz?
N
1. check C59, C60
2. check Y2
Y
CPU Reset ok?
N
check reset IC (U4), make sure U4 pin1 has delayed for certain period of time.
Y
1. check SRAM (U12), check CPU_LCS_N (U13 pin58) and CPU_BHE_N (U13 pin 4) is active?
2. check Flash (U14), R92 (NC), CPU_UCS_N (U13 pin57) is active?


Graphic port inputs trouble shooting
DVI connector: PC analog
N
check factory colorbar pattern generated by scalar
N
check scalar (U9) outputs at RN4, RN5RN6, RN8, RN10, RN12
Y
1. check Dsub_to_DVI adapter cable
2. check U35 (mux, AD8183)
3. check RGB signals at C90,C94,C95 (AD inputs)
4. check H/V sync at R188, R189 (AD inputs)
5. check U25 output data, H/V sync, pixel clock
Y
DVI connector: PC digital
N
1. check DVI_to_DVI cable
2. check U1 (EEPROM) with EDID
3. check DVI Reset signal at U29 (SII169) pin1
4. check U29 output data, H/V sync, pixel clock
Y
DVI connector: HDCP signal
N
Replace U29 (SII169)
Y
Comp1/2 connector: 480p signal
N
1. check component cable
2. check U32 (mux, AD8183)
3. check AD (U25) H/V sync output at R116, R117

]

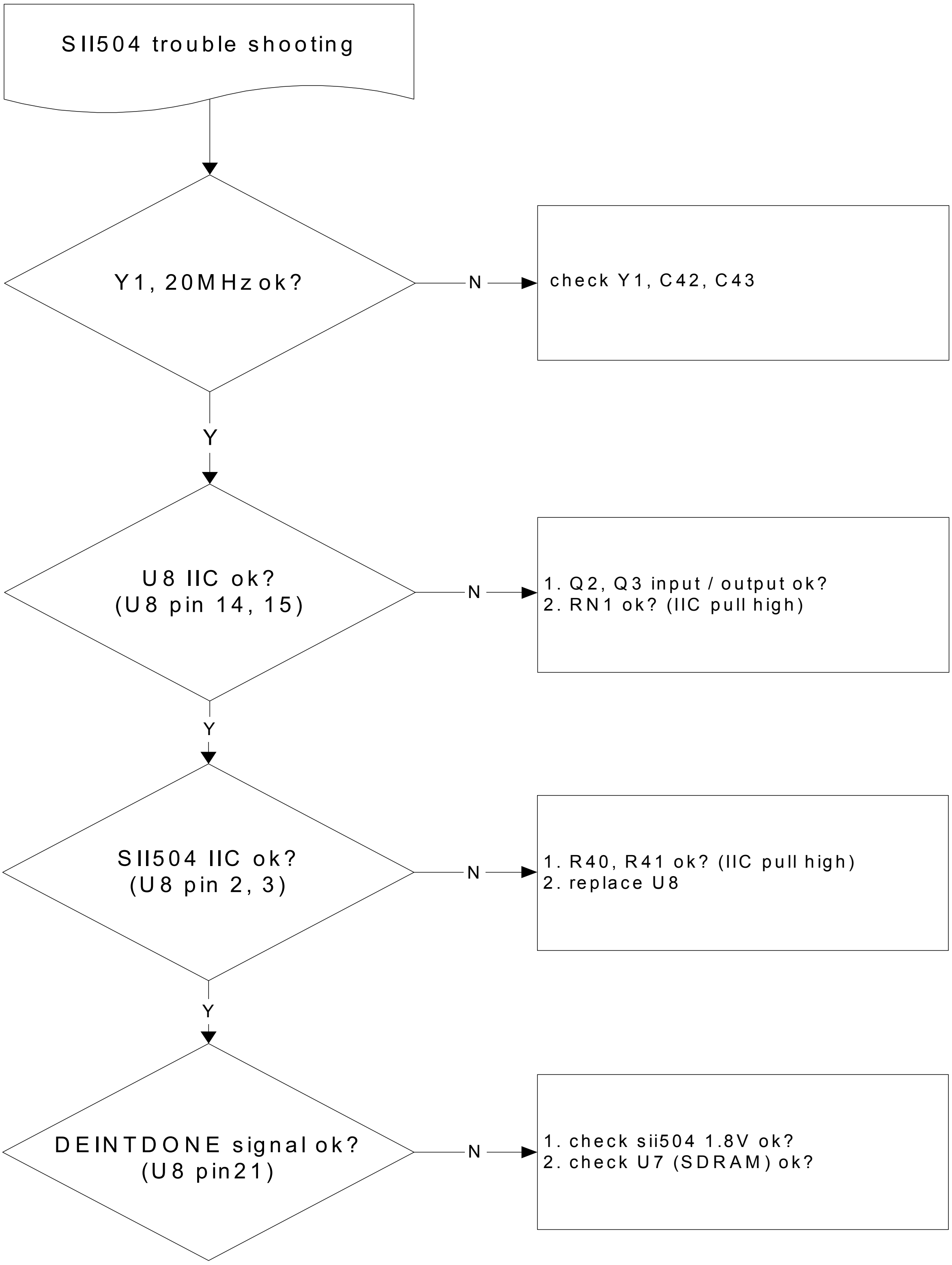


Video port inputs trouble shooting
Comp 1/2 connector: 480i
N
Y
S-video connector: NTSC
N
Y
composite video connector: NTSC
N

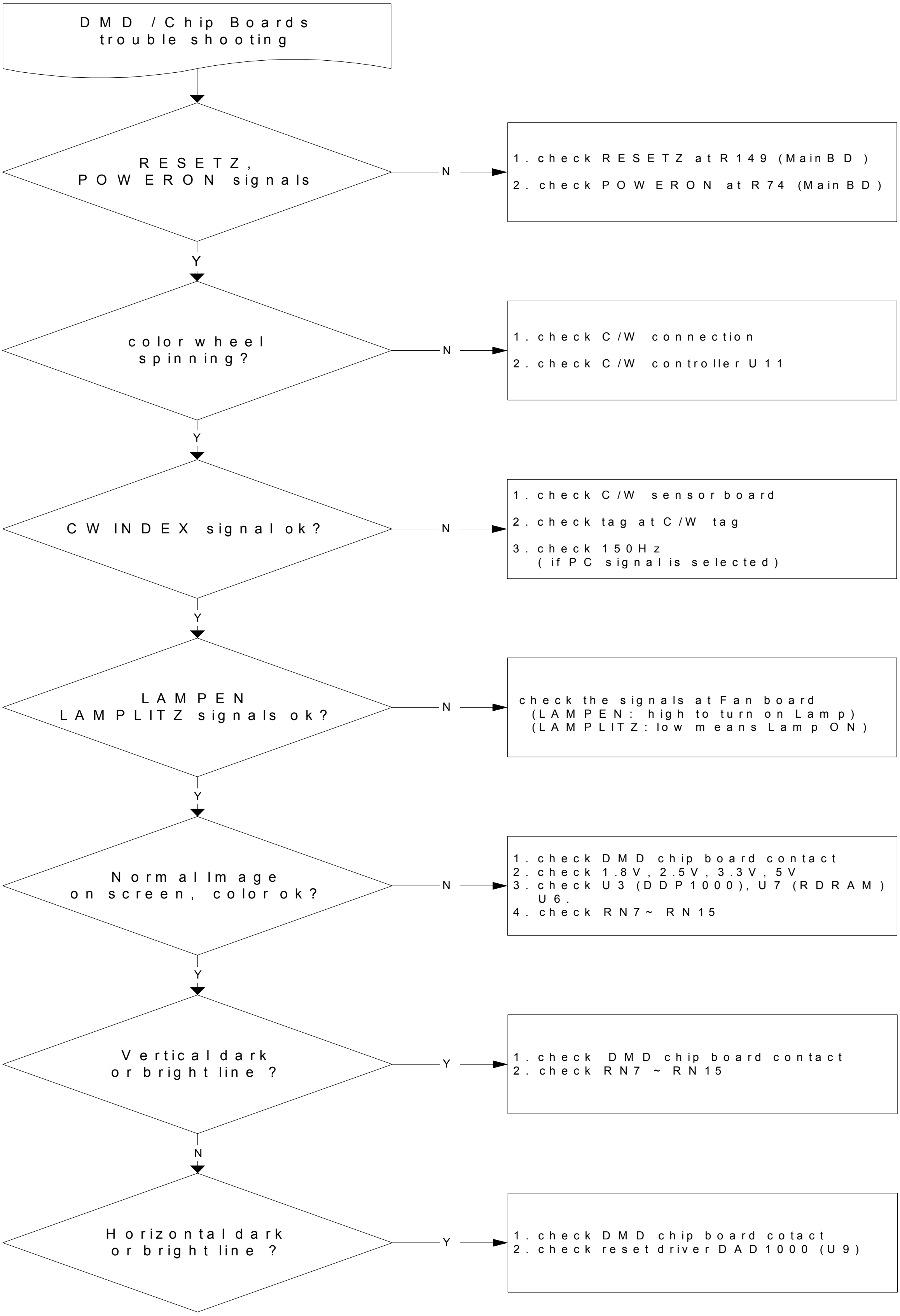
1. check comp 1/2 at SAA7118 (U30) input pins
2. check U30 H/V sync, clock output at R151, R152, R153
3. see SII504 troube shooting

1. check U30 Y/C inputs at C134,C135
2. check U30 H/V sync, clock output at R151, R152, R153

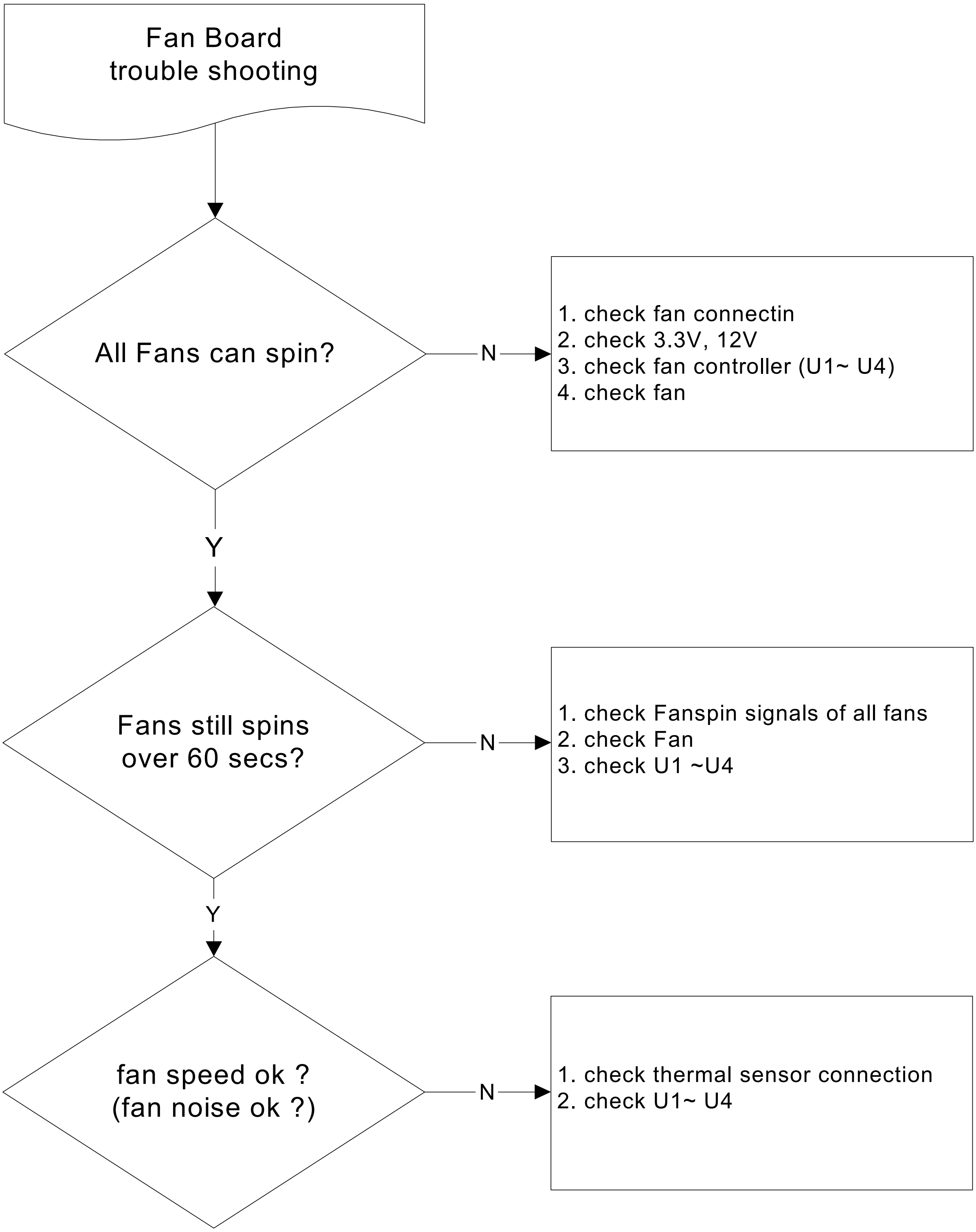
1. check U30 CVBS input at C158, C162
2. check U30 H/V sync, clock output at R151, R152, R153


SII504 trouble shooting
Y1, 20MHz ok?
N
check Y1, C42, C43
Y
U8 IIC ok?
(U8 pin 14, 15)
N
1. Q2, Q3 input / output ok?
2. RN1 ok? (IIC pull high)
Y
SII504 IIC ok?
(U8 pin 2, 3)
N
1. R40, R41 ok? (IIC pull high)
2. replace U8
Y
DEINTDONE signal ok?
(U8 pin21)
N
1. check sii504 1.8V ok?
2. check U7 (SDRAM) ok?

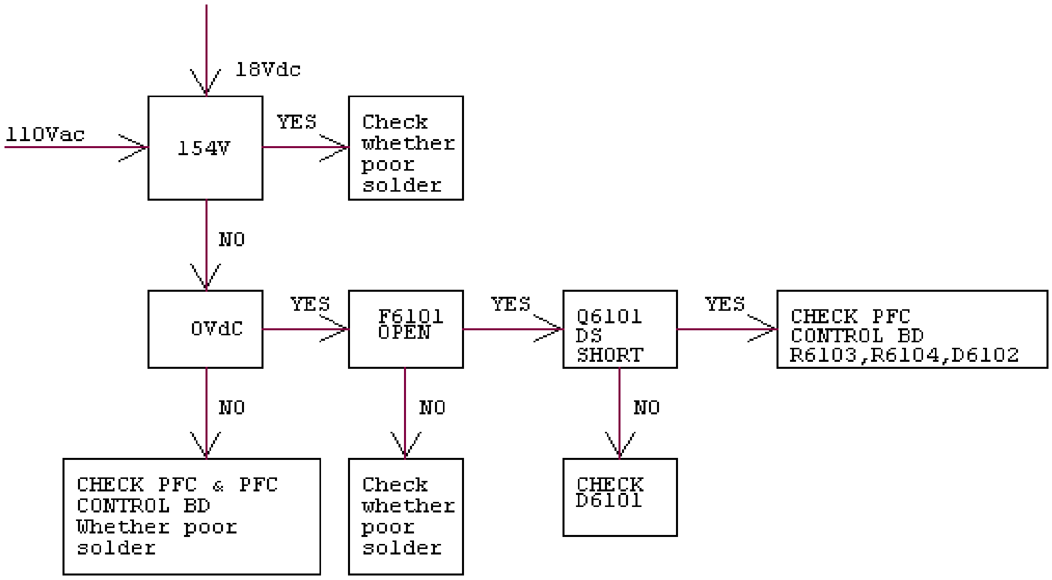
3) DMD board:


DMD /Chip Boards trouble shooting
RESETZ, POWERON signals
N
1. check RESETZ at R149 (MainBD)
2. check POWERON at R74 (MainBD)
Y
color wheel spinning?
N
1. check C/W connection
2. check C/W controller U11
Y
CW INDEX signal ok?
N
1. check C/W sensor board
2. check tag at C/W tag
3. check 150Hz (if PC signal is selected)
Y
LAMPEN LAMPLITZ signals ok?
N
check the signals at Fan board
(LAMPEN: high to turn on Lamp)
(LAMPLITZ: low means Lamp ON)
Y
Normal Image on screen, color ok?
N
1. check DMD chip board contact
2. check 1.8V, 2.5V, 3.3V, 5V
3. check U3 (DDP1000), U7 (RDRAM) U6.
4. check RN7~ RN15
Y
Vertical dark or bright line ?
Y
1. check DMD chip board contact
2. check RN7 ~ RN15
N
Horizontal dark or bright line ?
Y
1. check DMD chip board cotact
2. check reset driver DAD1000 (U9)

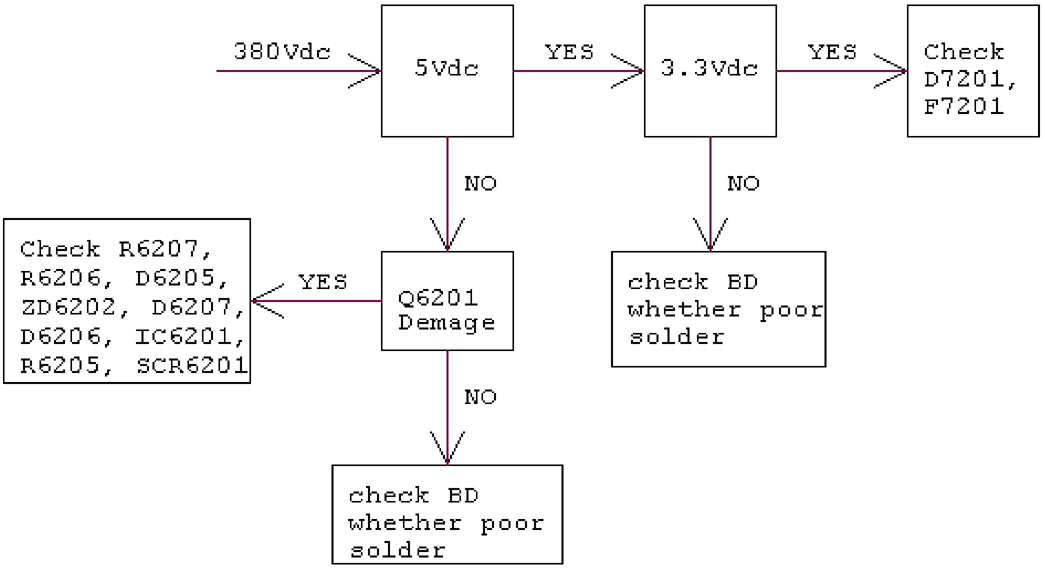
4) Fan board:


Fan Board
trouble shooting
All Fans can spin?
N
1. check fan connectin
2. check 3.3V, 12V
3. check fan controller (U1~ U4)
4. check fan
Y
Fans still spins
over 60 secs?
N
1. check Fanspin signals of all fans
2. check Fan
3. check U1 ~U4
Y
fan speed ok ?
(fan noise ok ?)
N
1. check thermal sensor connection
2. check U1~ U4

5) PFC board:


18Vdc
110Vac
154V
YES
Check whether poor solder
NO
0VdC
YES
F6101 OPEN
YES
Q6101 DS SHORT
YES
CHECK PFC CONTROL BD R6103,R6104,D6102
NO
CHECK PFC & PFC CONTROL BD Whether poor solder
NO
Check whether poor solder
NO
CHECK D6101

6) DC-DC board


380Vdc
5Vdc
YES
3.3Vdc
YES
Check D7201, F7201
NO
NO
Check R6207, R6206, D6205, ZD6202, D6207, D6206, IC6201, R6205, SCR6201
YES
Q6201 Demage
check BD whether poor solder
NO
check BD whether poor solder

10. Firmwave upgrade procedure

Step 1

Setup Flashloader in computer.

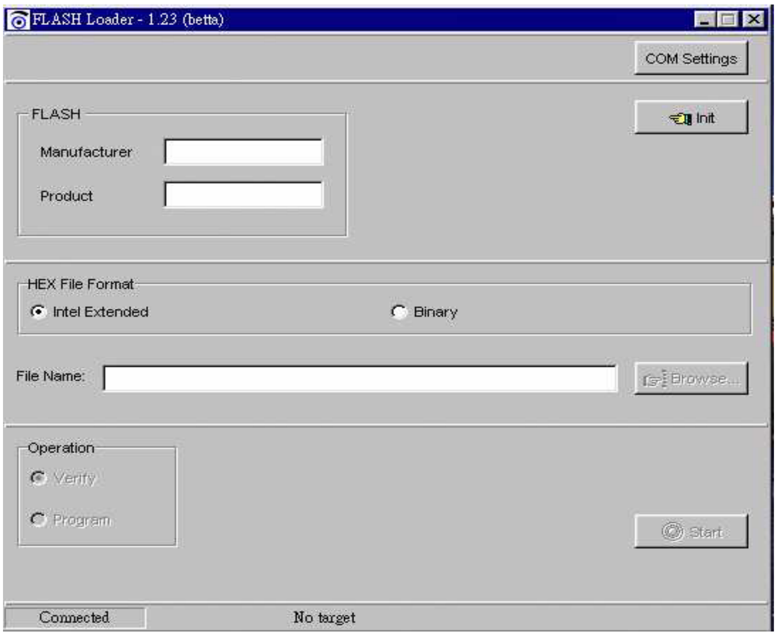
Step 2

a. Connect download cable with computer and projector

b. Connect power cord with projector and check power switch is OFF

Step 3

Execute FLASH loder.exe


FLASH Loader - 1.23 (betta)
COM Settings
Init
FLASH
Manufacturer
Product
HEX File Format
Browse...
Operation
Start

HEX File Format: ● Intel Extended ○ Binary

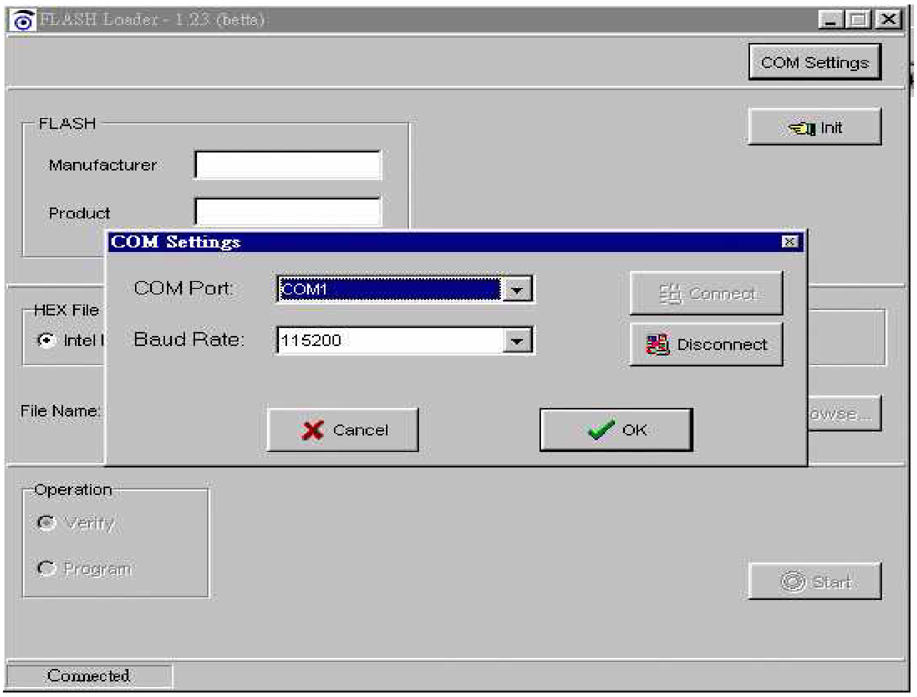
File Name:

Operation: ● Verify ○ Program

Connected No target

Step 4

Setting COM Port & Baud Rate


FLASH Loader - 1.23 (betta)
COM Settings
Init
FLASH
Manufacturer
Product
HEX File
Intel
File Name:
owse...
Operation
Verify
Program
Start
Connected
COM Settings
Connect
Disconnect
Cancel
OK

COM Port: COM1

Baud Rate: 115200

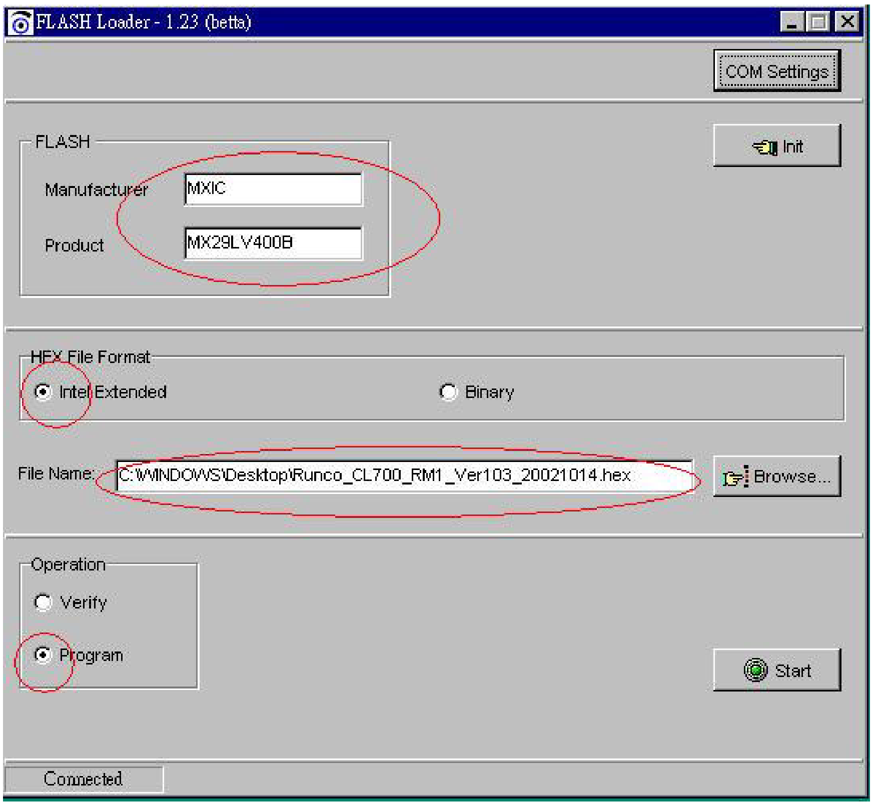
Step 5

a. Turn on the power switch of the projector, then the Program will target the Flash.

b. HEX File Format choose Intel Extended

c. File Name choose

d. Operation choose Program


FLASH Loader - 1.23 (betta)
COM Settings
Init
Browse...
Start

FLASH
Manufacturer: MXIC
Product: MX29LV400B

HEX File Format
● Intel Extended ○ Binary

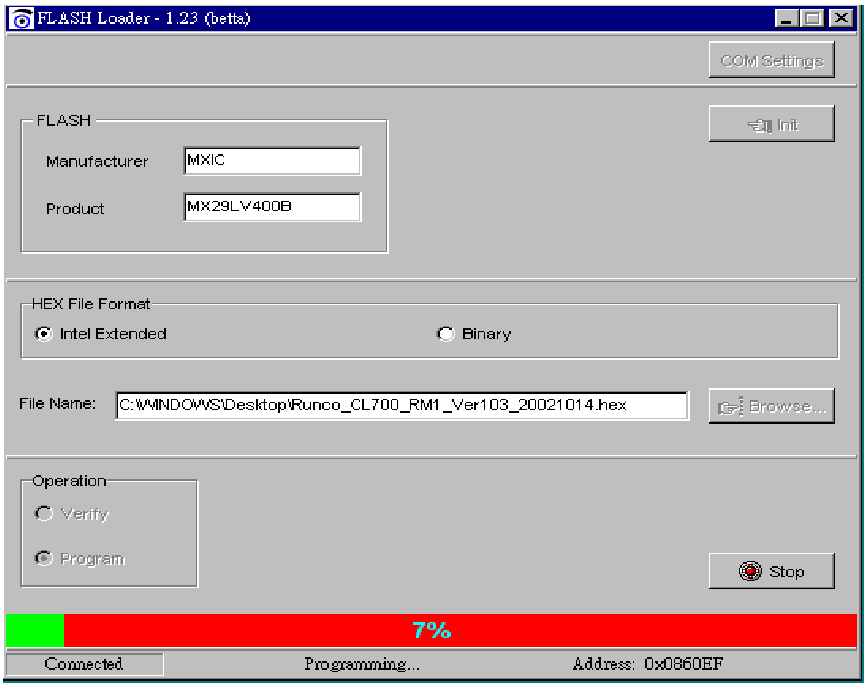
File Name: C:\WINDOWS\Desktop\Runco_CL700_RM1_Ver103_20021014.hex

Operation
○ Verify
● Program

Connected

Step 6

Start download firmware


FLASH Loader - 1.23 (betta)
COM Settings
Init
Browse...
Stop

FLASH
Manufacturer: MXIC
Product: MX29LV400B

HEX File Format
● Intel Extended ○ Binary

File Name: C:\WINDOWS\Desktop\Runco_CL700_RM1_Ver103_20021014.hex

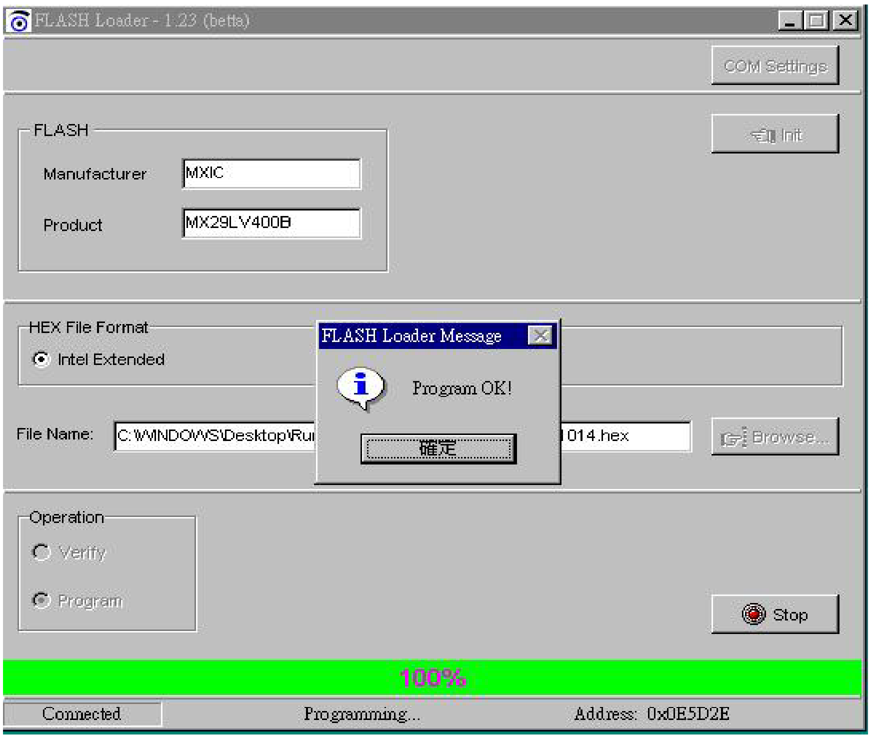
Operation
○ Verify
● Program

7%

Connected Programming... Address: 0x0860EF

Step 7

Download finished.


FLASH Loader - 1.23 (betta)
COM Settings
Init
Browse...
Stop
確定

FLASH

Manufacturer: MXIC

Product: MX29LV400B

HEX File Format: ● Intel Extended

File Name: C:\WINDOWS\Desktop\Ru 014.hex

FLASH Loader Message: Program OK!

Operation: ○ Verify ● Program

100%

Connected Programming... Address: 0x0E5D2E

Step 8

Turn off the power switch.

11. RS232 Codes

RS232 Codes List

Code	Function	Code	Function
X01	Power On	Y01	Save current factory settings
X02	Power Off	Y02	Load saved factory settings
X03	Message On	Y03	Load factory default
X04	Message Off	Y04	Load all user default
X05	Reset lamp timer	Y05	Burn-In mode on
X07	Save current active source settings	Y06	Burn-In mode off
X08	Change active OSD	Y07	Set RS232 baudrate as 9600
X10	Menu	Y08	Set RS232 baudrate as 115200
X11	Enter	Y10	Save as data color temperature 0 -> 9300K
X12	Exit	Y11	Save as data color temperature 1 -> 6500K
X13	Up(arrow key)	Y12	Save as data color temperature 2-> 5700K
X14	Down(arrow key)	Y13	Save as data color temperature 3 -> user defined 1
X15	Left(arrow key)	Y14	Save as data color temperature 4 -> user defined 2
X16	Right(arrow key)	Y15	Load data color temperature 0 -> 9300K
X20	Switch to Composite input	Y16	Load data color temperature 1 -> 6500K
X21	Switch to S-Video input	Y17	Load data color temperature 2-> 5700K
X23	Switch to DVI-analog input	Y18	Load data color temperature 3 -> user defined 1
X24	Switch to 1st component input	Y19	Load data color temperature 4 -> user defined 2
X25	Switch to 2nd component input	Y20	Save as video color temperature 0 -> 9300K
X26	Switch to DVI-digital input	Y21	Save as video color temperature 1 -> 6500K
X27	Switch to DVI_I input	Y22	Save as video color temperature 2-> 5700K
X35	16:9 (Anamorphic)	Y23	Save as video color temperature 3 -> user defined 1
X36	4:3 (Standard 4:3)	Y24	Save as video color temperature 4 -> user defined 2
X37	Zoom (Letter box)	Y25	Load video color temperature 0 -> 9300K
X38	Dynamic (Virtual wide)	Y26	Load video color temperature 1 -> 6500K
X39	Real (Through)	Y27	Load video color temperature 2-> 5700K
X40	Load memory 1 settings	Y28	Load video color temperature 3 -> user defined 1
X41	Load memory 2 settings	Y29	Load video color temperature 4 -> user defined 2
X42	Load memory 3 settings	Y30	Restore data color temperature to default
X46	Load default of current source	Y31	Restore video color temperature to default
X47	Save memory 1 settings	Y40	DMD -- Degamma table 0
X48	Save memory 2 settings	Y41	DMD -- Degamma table 1
X49	Save memory 3 settings	Y42	DMD -- Degamma table 2
X50	Scale up	Y43	DMD -- Degamma table 3
X51	Scale down	Y44	DMD -- Degamma table 4

X55	Switch active source	Y50	Enter Spoke light
X56	Picture in picture display	Y51	Quit Spoke light
X57	Picture by picture display	Y52	Enter Red Curtain
X60	Swicht language 1	Y53	Enter Green Curtain
X61	Swicht language 2	Y54	Enter Blue Curtain
X62	Swicht language 3	Y55	Enter Black Curtain
X63	Swicht language 4	Y56	Quit Curtain
X64	Swicht language 5	Y57	Color Bar
X70	Contrast shortcut	Y58	Chess Board
X71	Brightness shortcut	Y59	Optical 13-point
X72	Color shortcut	Y60	Reflective Edge
X73	Sharpness shortcut	Y61	Grid
X74	Tint shortcut	Y70	Load 'optical test' mode settings
X75	Color temperature shortcut	Y71	Load 'middle value' mode settings
X76	DLP degamma select shortcut	Y72	Load 'Play DVD' mode settings
X85	PC input - auto	Y73	Load 'CW delay adjustment' mode settings
X90	Image orientation - floor front	Y74	Load 'blue filter adjustment' mode settings
X91	Image orientation - ceiling front	Y96	Show lamp usage time
X92	Image orientation - floor rear	Y97	Show system errors list
X93	Image orientation - ceiling rear	Y98	Show factory OSD adjustment setting
X99	On line help	Y99	On line help

TOSHIBA CORPORATION
1-1, SHIBAURA 1- CHOME, MINATO - KU, TOKYO 105 - 8001, JAPAN